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CAPITAL, TECHNOLOGY, and LABOR in the NEW GLOBAL ECONOMY

Arthur F. Burns • Lewis M. Branscomb
Yotaro Kobayashi • Jagdish Bhagwati

James H. Cassing and Steven L. Husted, editors

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Acknowledgments

It falls on us, the editors, to note that this volume contains *inter alia* the proceedings of a University of Pittsburgh bicentennial colloquium on current problems in international economic factor markets.

That colloquium, held on March 17 and 18, 1987, was organized by Dr. Mark Perlman (The University Professor of Economics) under the auspices of the University Center for International Studies. Professor Burkart Holzner is the center's director; they were ably assisted by Dr. Ursula Davis, who served as the center's coordinator for the several bicentennial academic events.

We wish to thank them as well as Dr. Wesley W. Posvar, president of the University of Pittsburgh, for the support given to the colloquium.

We desire also to mention the great cooperation offered by Mr. Christopher C. DeMuth, president of the American Enterprise Institute for Public Policy Research, in arranging for the publication of this volume.

Finally, we acknowledge with appreciation the help given us in editing this volume by Ms. Kelly Shaffer.

Foreword

This volume is built around four papers commissioned as part of the University of Pittsburgh's bicentennial celebrations.

Institutional bicentennials present obvious opportunities to look far into the past as well as into the future. They are also, if less frequently, an opportunity to examine what the institution is doing at the moment and to raise questions about the need for immediate programmatic change.

In this instance, the programmatic change relates to what the University of Pittsburgh faculty understands and teaches about international economic relations. Specifically, those of us who organized the colloquium were interested in what is changing in our theoretical perceptions of

- the international market for financial capital
- the international transmission of technology, particularly "concrete" capital equipment
- the uses of marketing in changing internationally the locus of manufacturing production
- the flows of labor over international boundaries

At the University of Pittsburgh we have taught the pure theory of international trade in the conventional form. Our models are fully specified, and our graphs are clear. We pride ourselves on doing well what other academic centers also do. But some of us have doubts—we wonder whether the conventional theory really applies to current institutional problems.

In particular, we have come to realize that our theory does not take fully into account the many institutional complexities thrown up by recent events. These events stem in large measure from two sources:

- the impact of new technology
- the economic effects of the politicogeographic extension of the market

The role time plays in economic analysis has grown, particularly since the late 1880s, when Böhm-Bawerk introduced the efficiency concept of roundaboutness. The costs of time delays in the economic process affect many aspects; among these are the costs introduced by lags in communications, particularly between geographically separated markets or between sellers and buyers. In the past three decades, jet airplanes have made travel to any spot on the earth manageable in less than twenty-four hours, so that producer-sellers in, say, Japan can provide repair or service personnel to buyers in, say, Brazil.

Moreover, from the standpoint of providing information—particularly that requiring iterative exchanges—even more recent satellite technology has perfected telephonic and facsimile communications in such a way as to make worldwide conversations technically clear and economically cheap. This technology, when coupled with computer-to-computer interaction, has served to accentuate the universality of quick and complete knowledge sharing. Technology, thus, has seemingly reduced almost to zero the costs of distance and information sharing. Surely the recent behavior of the various capital markets in Tokyo, Hong Kong, Frankfurt, London, and New York illustrates these points.

Choosing the Method of Approach

To observe that the relationships between ideas, policies, and institutions are complex is banal. Nonetheless, it is a truth worth emphasizing, particularly when one works in the constrained atmosphere of the university classroom, where, in the absence of personal experience, so much emphasis is put on abstractions such as models. For this reason in particular, current methodological debate, *as such*, within the economics discipline has in good measure focused on the relationship between the uses of models and the "importance" of empirical observations.

In actual classroom practice, however, the economics profession has come to rely increasingly on formal or mathematical expression, and it has unconsciously moved *into* the tradition of Cartesian reason as the primary basis for its analysis. What it seems to have moved *from* is primary reliance upon the tradition of British pragmatic empirical investigation. That tradition hardly eschewed analysis, but it did stress the dangers of wandering too far from observable fact.

The recently preferred methodology, Cartesian reason, has many attractions, not the least of which is its universality and, in many instances, specificity and determinateness. Thus it encourages be-

guilingly neat modeling and the development of simple but logical results.

Yet one danger of relying on Cartesian reason is that it easily "lives in its own world," a world that, as noted, we organizers of the University of Pittsburgh bicentennial colloquium have begun to doubt bears much resemblance to the observable world of international economics, 1980–1999.

What we sought as part of the University of Pittsburgh bicentennial colloquium was to develop up-to-date descriptions of the operation of the four economic factor markets. To that end four papers were commissioned. Each paper served as the basis for two sets of comments:

- One dealt with revising the teaching curriculum.
- The other dealt with identifying new areas for sponsored and unsponsored research.

Although in the live presentation there was some wandering from the original plan, this volume—particularly with the addition of a generalizing first chapter—does follow that outline. Each of the four sessions, built upon a commissioned paper, the discussants' comments, and some open "floor" discussion, is presented separately.

The Dramatis Personae

The first paper was prepared by the Honorable Arthur F. Burns—*inter alia* professor emeritus (Columbia University), erstwhile chairman of the Council of Economic Advisers, chairman of the Board of Governors of the Federal Reserve System, and American ambassador to the Federal Republic of Germany. Because of Professor Burns's illness and subsequent death, his paper was never fully revised. He did, however, direct that certain tables be appended to his draft.

The Burns paper was discussed by two University of Pittsburgh professors of economics, Steven L. Husted (then on assignment as a senior staff economist at the Council of Economic Advisers) and James H. Cassing.

The second paper was written by Dr. Lewis M. Branscomb, longtime vice president as well as chief scientist of the International Business Machines Corporation (IBM) and now professorial director of the Harvard University Science, Technology, and Public Policy Program. It was discussed by Professor William E. Souder of the Department of Industrial Engineering at the University of Pittsburgh and Dr. Nam Pyo Suh of the National Science Foundation.

The author of the third paper was Mr. Yotaro Kobayashi, presi-

dent of the Fuji Xerox Company (Tokyo). Professor C. Whan Park of the Graduate School of Business at the University of Pittsburgh, and Dean Toni Carbo Bearman of the University of Pittsburgh's School of Library and Information Science, discussed the paper.

The last paper was presented by Professor Jagdish Bhagwati, the Arthur Lehman Professor of Economics and Political Science at Columbia University. That session was chaired by the Honorable Nathan Stark, a longtime University of Pittsburgh vice chancellor and one-time under secretary of health, education, and welfare, who in his cabinet period supervised the immediate disposition of the Cuban Marielle refugees. The two discussants were Professor Joseph Eaton, of the University of Pittsburgh's Graduate School of Public and International Affairs, and the Honorable John T. Dunlop, one-time secretary of labor and longtime Lamont University Professor at Harvard.

The colloquium was held under the direct auspices of the University of Pittsburgh University Center for International Studies (UCIS), of which Professor Burkart Holzner is the director. Specific responsibility for the organization of the program was divided between Dr. Ursula Davis (of UCIS) and Mark Perlman.

Professors Cassing and Husted, both specialists in international economics within the University of Pittsburgh Department of Economics, graciously agreed to reexamine the proceedings, prepare the conclusions that could be drawn, and take the editorial responsibility.

MARK PERLMAN
The University Professor of Economics
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Introduction

James H. Cassing and Steven L. Husted

International economics is broadly the study of global economic activity. In particular, the focus is on movements of such activity—trade and finance—across national borders. In models of international trade, dating back at least as far as Adam Smith and David Ricardo, a functional distinction was made between goods and factors of production—including knowledge of technology and most financial capital services—in that the former were traded between countries and the latter were not. Any discussion of marketing and distribution techniques was, at best, relegated to a footnote. Thus free international trade was modeled as a situation in which commodity markets were globally integrated while factor markets were wholly domestic. While it was generally recognized that such a view of the world strained credulity, the stylized model did clearly elucidate the potential gains from international commerce driven by comparative cost differences. Indeed, the welfare case for international trade was all the stronger because technology and factor flows—seemingly obvious sources of welfare improvement—were disallowed.

In the two hundred years since Smith and Ricardo, international economics has surely accommodated many additional aspects of reality. We still study the causes and consequences of trade in commodities, but the modern course in trade theory and finance makes clear mention of the evolving globalization of production, distribution, and financial services. What seem to be less clear, however, are the extent and precise nature of the globalization process and whether the traditional classroom focus on globalized commodity trade should be subordinated a bit to the emerging globalization of the factor markets.

This volume presents papers, comments, and floor discussion from a colloquium held at the University of Pittsburgh in March 1987 in honor of the bicentennial of the university. The colloquium focused on reforming the international economics curriculum in light of the rapidly changing world commercial environment. The papers in this

volume discuss the global integration of markets in four key factors of production: financial services, information and technology, marketing and distribution, and labor.

Globalization, Factor Markets, and International Economics

Nowhere has the globalization of national markets been felt more strongly than in the financial markets. Today the world financial market never sleeps. International banking centers have emerged in such places as Bahrain, the Netherlands Antilles, and Singapore and have expanded in more traditional locations such as London, Frankfurt, New York, and Tokyo. Increasingly, corporations and governments look beyond their own borders to the international capital market to fund their planned expenditures. The centers have responded by creating a wide variety of new financial assets, many with very specialized characteristics.

The first paper in this volume, written by Arthur F. Burns of the American Enterprise Institute, discusses recent changes in the financial markets and the implications of those changes for the American banking industry. Owing to Dr. Burns's long service w the U.S. government, most notably as chairman of the Federal Reserve System, it is not surprising that the chief focus of his paper is on two issues related to the role of government in this changed environment: regulation of the banking system and coordination of national monetary policies.

Burns begins by establishing a point of reference—the American banking system during the 1950s. In that earlier age there was little in the way of competition from either domestic nonbanks or foreign banks. Regulation ensured stable markets, relatively high profits, and credit allocation on the basis of traditional "old boy" ties. In return, the relative safety of banking operations in even the most adverse of business climates made the job of the banking regulator easy.

This situation would not last. New practices of cash management, sparked perhaps by a surge in inflation and nominal interest rates in the mid-1960s or by partial capital controls imposed for balance-of-payments reasons, began to undermine the system. Corporations developed financial instruments that allowed them to raise funds without going to the commercial credit window of banks. Lenders seeking higher returns than those available from banks were eager to supply funds directly to the corporate sector. Banks faced a dilemma. They responded to their loss of traditional customers in a variety of ways. First they developed a series of new financial ins uments designed to circumvent the regulations that were suddenly limiting

rather than protecting their profit opportunities. Then they set into motion a considerable lobbying effort seeking to ease banking regulations. They also established foreign subsidiaries to attract both new loan customers and new sources of funds in overseas markets. Finally, as banks lost more of their traditional business, they began to replace it with the provision of "off-balance-sheet" services, such as the sale of loans and the provision of standby letters of credit.

The result of all these changes is the American bank we know today. An increasingly larger share of bank profits comes from the provision of off-balance-sheet services. As a consequence, many of the activities of banks are no longer subject to regulation. Moreover, many of the regulations on traditional banking activities, some in place since the 1930s, have been lifted. Accompanying deregulation has been a dramatic increase in the number of bank failures.

Overseas the experience has been similar. The industrialized countries have relaxed a variety of capital controls. Competition for customers has narrowed international differences in costs of finance. Technological advances in data storage and transfer and in communications have led to further integration of markets. Because of these linkages, there is a growing danger that problems in any one banking center could quickly spread to others, ultimately producing a collapse of the entire system.

These circumstances put considerable pressure on the bank regulator, whose goal is to protect the payments system. The business environment of the banking system is truly international, but the reach of the regulator ends at his geographical border. His problems are compounded by the fact that he can no longer assess the safety of many of the banks' activities, nor does he have regulatory control over various nonbanks that have joined in the provision of payments services.

Should the system be changed, and, if so, how? Burns clearly thought the answer to the first question was yes. His fears about the future of the system and the potential for catastrophe loom large in the paper. He offered no answer to the second question, which he considered an important new challenge for the academic community to take up.

A second complication of the globalization of international financial markets—and one that economists understand somewhat better—is the need for cooperation among central bankers in the conduct of monetary policy. As financial instruments of one country become better substitutes for the instruments of another, policies that change relative demands and supplies of assets in one country tend to have effects both at home and abroad.

As Burns points out in his paper, even though academics and government bureaucrats have a substantial understanding of the need for policy coordination, achieving this cooperation is an elusive goal. This is due, in part, to international differences in economic experience and perceptions about the need for changes in policy. It is also due to politics, for national leaders are reluctant to subordinate national policy objectives to a set of economic targets selected (or dictated) by foreign leaders. Achieving a world of heightened coordination and cooperation requires a better understanding of the political process, coupled with knowledge of the economics of what such agreements are capable of producing.

The second paper in this volume, written by Lewis Branscomb of Harvard University's John F. Kennedy School of Government, explores the international diffusion of technology and the relationship between science and technology. His main point is that the way in which science and technology are linked in today's world tends to accelerate international economic interdependence: basic science defines the options for technology. A growing number of countries possess labor forces with basic scientific skills and training in engineering. Expanding competition in the world markets means that scientific breakthroughs announced in one country are quickly incorporated into commercial applications. This, in turn, means that countries, such as the United States, that have been leaders in fundamental science will find it increasingly difficult to appropriate commercial benefits from scientific discoveries.

If scientific leadership does not determine commercial success through technological innovation, what does? Technological advance is driven by a variety of factors, including socioeconomic conditions. Moreover, it can often be predicted by simple trend lines. Consider the well-understood growth in the productivity of microelectronics that leads to annual reductions in the costs of computer systems. Marketplace pressures direct engineers working on computer peripherals, such as printers, to improve the productivity of these devices. And costs per unit output of computer peripherals have fallen at roughly the same rate as the cost of the rest of the computer system. In his comments Nam Pyo Suh of the National Science Foundation agreed that factors such as the national and local environment play an important role in innovation. He also noted that technological advance is capable of being a driving force for new science. An example is the invention of the steam engine and the resultant establishment of the study of thermodynamics.

The link between science and technology enables a globally based firm to transfer technology to manufacturers in other countries

and thereby take advantage of local factor market conditions. The rate at which technology can be disseminated grows with the increased ease of electronic information transfer, with the growth of formal engineering training in newly industrializing countries, and with the increased use of automation and computers in design and production.

These trends have important implications for government policy, industrial decisions, and curriculum reform, especially in countries, such as the United States, that are leaders in the development of basic science. First, the location of production depends on the ability to implement productive innovations. Crucial to this process is a reassessment by domestic firms of the importance of research and development and by universities (and the engineering profession) of the need to teach process engineering. Government programs that provide expanded funding for basic scientific research merely serve to subsidize our strengths; because scientific knowledge is transferred internationally at very low costs, scientific breakthroughs here are quickly appropriated by those countries with the wherewithal to apply them in practice. Expanding on this point in his comments, William Souder of the University of Pittsburgh Faculty of Engineering offers a blueprint for reform of engineering curriculums so that "every course should emphasize an integrated system of creating and applying technologies." He goes on to argue that government policies aimed at subsidizing technological innovation make sense only *after* such a system is in place in the universities of this country.

The international commercial appropriation of national scientific breakthroughs places considerable pressure on policy makers to close markets and to limit access to locally developed intellectual property. Because high-technology production is increasingly capital intensive, economies of scale play an important role in determining the direction of trade. Recent research in strategic trade policy makes it clear that governments have an incentive to manipulate trade rules in order to capture a dominant market share for their firms.

Countering these trends is the growing importance of local consumer satisfaction in defining the characteristics of a product. Market success increasingly depends on the availability of complementary products, among them service support and software. These products tend to be locally dependent, requiring intimate knowledge of the market and careful training. Transfer of this knowledge is slow and costly, depending in part on the degree of access to foreign markets.

One measure of the globalization of the information network is the extent to which business corporations now perceive their operating environment to be the world economy and therefore substantively adjust their behavior. In the third paper of this volume, Yotaro

Kobayashi, president of Fuji Xerox Company, argues that such adjustment is well advanced. While the trend toward globalization is not new, of course, the extent to which it now pervades corporate strategy is fairly recent.

Kobayashi addresses both the source of this globalization and its ramifications. The source is clearly technological sophistication, which allows individuals to exchange materials and information with greater speed, efficiency, diversity, and especially "extensiveness." In particular, modern technology and systems allow an individual to avail himself of a global network of information on options and opportunities.

The response of corporations to the prospect of being informationally closer to diverse markets around the world marks a fundamental change in marketing techniques and in the provision of maintenance service. Most large corporations now accept that they must expand their geographic area of sales globally. The efficient strategy so far, however, has been one of centralizing research and product development, marketing a standardized line of products worldwide, and relying on local sales organizations to educate the customer to accept a worldwide product concept. The logic of the strategy is to generate a high world market share, and so economies of scale, in a highly capitalized factory. Successful examples include Sony Walkman and Coca Cola.

Several forces, however, are working against the world product concept. These forces include wide currency swings, protectionist sentiment, and a growing recognition that unique national characteristics of consumers persist and cannot be ignored. In this new environment the advantages of centralized production are lost, and therefore a business presence in each of the major markets is becoming standard. The recognition of pervasive taste differences among cultures has reinforced the trend toward customizing products to local needs and preferences made possible by the information-processing revolution. In a sense, the traditional view of a globalized final product market has been supplanted by the view that local product design matters, and so there has been a globalization of the production, design, and distribution system. As C. Whan Park of the University of Pittsburgh's Graduate School of Business commented, the emphasis has shifted from how to make a product better to how to make a better product.

This is an especially timely insight in light of current research concerning trade in differentiated products. The standard theory of trade in commodities predicts interindustry trade between countries based on comparative cost differences. Kobayashi might be inter-

preted as suggesting that the information revolution, by bringing markets closer to producers informationally, may be part of the reason for the growth of *intra*industry trade as businesses try to tailor their products to local characteristics and begin to service their expanding presence in one another's markets.

Furthermore, Kobayashi emphasizes that for many products, maintenance provisions are an important component of the finished commodity. Maintenance costs, however, depend on economic conditions in the country of *sales*, not production. Thus, while comparative costs still drive trade, the traditional sharp comparison of relative production costs between countries becomes fuzzy. For example, a product targeted to a labor-abundant country may be produced in such a way that its maintenance entails especially labor-intensive techniques, while the same product targeted to a capital-abundant country may be produced entirely differently.

As the emphasis on local market characteristics has grown in importance for product design, research facilities have also been globalized. Apparently an international presence for research and development offers the modern corporation a "technology window around the world." But here, in discussion, Toni Carbo Bearman, dean of the University of Pittsburgh's School of Library and Information Science, pointed to a tension created by the information revolution. The seeming boon of cheaper knowledge transferral may, in fact, threaten intellectual property and privacy rights and even national security. Thus there may be an important role for policy.

The role of government policy in globalization was reiterated with respect to other input markets. Undoubtedly the most important factor of production, contributing on average 70 percent of value added, is labor. But the process of globalization in the labor market has been a policy issue as much as a purely economic issue. In the final paper of this volume Jagdish Bhagwati, Arthur Lehman Professor of Economics and Political Science at Columbia University, addresses the issues associated with labor migration and focuses on the taxation of skilled labor flows in particular.

Labor flows across national boundaries are not new. There is probably less migration today than in yesteryear. What is different in the postwar era is the substantial growth of temporary foreign worker programs, estimated to include as many as 15 million workers by 1980. Beyond this have been substantial refugee movements in Asia, Africa, and Central America, as well as large illegal immigration into Europe and the United States.

As a framework for analysis, Bhagwati distinguishes between unskilled and skilled labor flows and between source and destination

countries as poor, rich, or centrally planned. While there is substantial migration from rich to rich and from poor to poor countries, the most dramatic flows have been from poor to rich countries. These include especially the *Gastarbeiter* programs of Western Europe, importation of workers by members of the Organization of Petroleum Exporting Countries (OPEC), and permanent immigration, including that of refugees.

A significant portion of the total number of immigrants are professionals—on the order of 11 to 13 percent for the United States and 20 percent for Canada, although it is difficult to measure precisely. In his discussion, John Dunlop of Harvard University reiterated that the skilled-unskilled distinction is quite fuzzy. Nonetheless, skilled immigration has apparently risen significantly, especially from developing countries to industrialized countries, because of legislated changes away from country ceilings in the United States, Canada, Australia, and the United Kingdom.

On account of this trend toward professional migration and perhaps because of the perceived importance of professionals to the development process, there is considerable renewed interest in the consequences for the global economy of a "brain drain." Bhagwati notes that although such an emotive phrase connotes that an outflow of skilled labor is a problem for the source country, the actual welfare consequences of such migration are far from obvious. For example, if the outflow acted as a safety valve for otherwise unemployed professionals, the cost in output forgone would be zero, and political unrest in urban areas might be dissipated. But this is a static view. A more dynamic analysis should incorporate the increased supply of professionals in response to the perceived opportunity to migrate to a higher wage. Thus the long-run steady pool of unemployed professionals might rise in the source country.

Bhagwati's sense is that migration of skilled labor is a real problem for smaller developing countries but not as much of a problem for larger countries such as India, at least not at the aggregate level. This might explain why the smaller countries have aimed to prevent the brain drain while larger countries have sought to exploit the outflow.

Developed countries typically restrict immigration. Therefore, developing countries' restrictions work more to shift the skill composition of emigrants and, collectively, to alter the source countries from developing to developed countries. Restrictions include passport denials, periods of domestic service, and efforts to prevent students from staying on abroad. Bhagwati is critical of these sorts of restrictions because they are commonly nuisances and are often inequitably manipulated by the more powerful or ingenious. At any rate,

one might object to prohibitions on voluntary global movements of individuals purely on utilitarian grounds.

Bhagwati then poses a dilemma. On the one hand, the brain drain from developing countries is inexorable in his view and, because of nondiscrimination provisions in key industrialized countries, is likely to increase. On the other hand, restrictions on out-migration are frequently inequitable and probably in the aggregate ineffective. How then can source countries capture returns to publicly provided goods like education and the benefits of citizenship from their nationals living abroad? Bhagwati's resolution of the dilemma entails changes in institutions and tax policies that would permit developing countries to benefit from having their skilled citizens working outside the country. There might be more institutional flexibility and cooperation between developed and developing countries. For example, dual university appointments and other professional "sharing" patterns might be encouraged.

In his discussion Joseph Eaton of the University of Pittsburgh's Graduate School of Public and International Affairs noted that international agreements amenable to such sharing—such as cooperation on pensions in the United States and Europe—are already beginning to appear. Eaton proposed even more extensive programs, such as low-cost round-trip airfares to the homeland to promote bonding. Dunlop added that the International Labor Organization already offers an international infrastructure for dealing with coordination of national behavior through Convention 97.

Another, complementary approach would extend the income tax jurisdiction of developing countries to their professionals residing abroad. The taxes might be collected by the developed countries and returned to the developing source countries in a lump sum, or the nationals living abroad might simply owe a tax liability directly to the source country. Bhagwati favors the latter scheme on the grounds that those enjoying the benefits of citizenship should surely pay some taxes to the mother country.

Specifically Bhagwati advocates a global system of income tax jurisdiction in which citizenship, not residence, is the basis for taxation. Eaton pointed out in discussion that if foreign countries tax their nationals resident in the United States, the U.S. tax codes give full credit for the taxes paid to the foreign nations. That many foreign nations do not do this may reflect an issue beyond mere clerical difficulties in collection. While recognizing various information and coordination problems, Bhagwati views the really serious problem as one of political economy. Expatriates and their influential kin in the source country may be cool to such a proposal.

Toward an Agenda for Curriculum Reform

Clearly, many of the issues raised and problems posed are not part of the traditional international economics offering. The sense of the conference was that just as the world has become more internationalized, so too must the university. More specifically, the question was posed: How should one go about getting professors to incorporate this material into their courses? We envision a three-part approach to the problem focusing on research, interdisciplinary and extracurricular professional input, and student feedback.

First, professors must become more familiar with the globalization of national markets and the effects the process has had—and is having—on national economies. Thus it is crucial that economists and others in the university address these issues in their research agendas. In our brief description of the papers in the volume we have already discussed several important areas for future research. In addition, we would note that some important areas for research cut across the subject matter of several of the papers.

The problem of forming and enforcing national government policies on entities that are truly international is an interesting theoretical problem in itself. It is also clearly an issue of practical concern, as described by several of the authors of this volume. For instance, Burns worried about the problem of regulating the payments system in an environment where foreign financial institutions are almost perfect substitutes for domestic institutions. Bhagwati was troubled by the possibility of migrants' free riding on the benefits provided by source countries. Branscomb was concerned with protecting intellectual property rights in an age when information and ideas are instantly, and almost costlessly, transmitted across the world. In each of these cases the author ventures that there is a role for government in solving the problem. What are the appropriate policy responses? Neither Burns nor Branscomb presents precise answers. Bhagwati suggests a solution to his problem, but achieving the solution is likely to be problematic. It is important to note that the need for solutions to problems such as these is great. The alternative for frustrated policy makers may be market-closing legislation and the resultant deadweight costs.

Another theme for research, suggested particularly in the papers by Branscomb and Kobayashi, is the internationalization of production. Is the multinational firm the emerging dominant model of industrial structure? Is this a cause for concern in countries such as the United States, where smaller and smaller fractions of the work force

are engaged in manufacturing? In such an environment, what does international competitiveness mean, and how is it achieved?

These are important issues, painted with a very broad brush. In the papers that follow they are spelled out in more detail. Considerable discussion of other research topics is found in the four papers of this volume, the discussants' comments, and the summaries of the floor discussions. Addressing these timely questions scientifically calls upon the university to serve in its traditional role of promoting socially productive research and is the first step toward incorporating new ideas in the curriculum.

A second step is for economists to talk to other practitioners, including academics from other disciplines and professionals close to the issues but outside the university. It is important for economists to find out what people working in the business-related areas of marketing, management, and finance know about evolving institutions. It is also important for economists to integrate their research better with that of other scientists working in fields such as information science, political science, sociology, and especially history. The logical forums for such interactions would be university- and industry-sponsored colloquia.

Finally, it is important for us, as academicians, to remember that the learning process should be bidirectional. We teach our students many things, but we can also learn from them. Economics has always been a framework for analyzing and understanding empirical phenomena. We should become better informed about how well this framework serves our students after they have left the university. Feedback of this kind would help to ensure that, as the process of globalization expands into new markets, economists will have properly adapted the science to deal with these circumstances. Our feeling is that the curriculum that best serves students in a dynamic and increasingly integrated world is the truly liberal one that cuts across cultures and disciplines.

PART ONE

The Ongoing Revolution in American Banking

The Ongoing Revolution in American Banking

Arthur F. Burns

Since the late 1950s commercial banking has undergone revolutionary changes, and the process has recently accelerated. Thirty years ago our banks were mainly engaged in providing their local communities with the traditional banking services of accepting deposits and making loans and investments, and they operated—more or less comfortably—behind walls of government regulation and business practice that separated them from other financial institutions. Today, as a result of deregulation, advances in technology, and innovations in financial practice, commercial banks find themselves engaged in intense competition with other financial institutions in national and global markets—not just for traditional banking business but also for other kinds of financial services, many of them new and exotic.

It is, of course, no great news that an industry is undergoing rapid change; the phenomenon of change has been at the heart of economic events ever since the industrial revolution began some two centuries ago. But rapid change in banking is a matter of special concern. Commercial banks serve, in effect, as trustees of other people's money, and the public interest therefore requires that they be managed prudently. Although they are privately owned organizations, they are the main providers of an essential public service—that of administering our system for making monetary payments. Commercial banks have also been serving as the conduit for monetary policy—that is, as the channel through which central banks seek to stabilize national economies. Turmoil in banking has major implications for the public welfare in each of these connections, and that is

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This chapter is an initial draft of a discussion paper prepared for the conference at the University of Pittsburgh. Arthur Burns died on June 26, 1987, before he had an opportunity to revise and refine it. At the request of Dr. Burns, supporting evidence was gathered and is included with this chapter in an appendix; but because of his death, Dr. Burns did not see or review the material in the appendix.

why all modern governments regulate banking more closely than most economic activities.

The story of how banking in the United States has changed over the past thirty years is sketched in the first three sections of this paper. The first section describes the business of banking as it was conducted in the late 1950s. The second and third sections, respectively, explore the changes that occurred through the end of the 1970s and those that have occurred thus far in the 1980s. The fourth section considers the problems posed by these changes for bank regulators seeking to ensure the safety and soundness of individual banks and the stability of the financial system generally. The final section is concerned with problems in the area of monetary policy posed by the vast economic and financial developments that have transformed banking in our times.

In preparing this essay, I have benefited enormously from the constant and tireless assistance of my scholarly friend Dr. Arthur Broida, who served for many years as a senior member of the staff of the Federal Reserve Board and is now my associate at the American Enterprise Institute. I owe a debt of gratitude also to my secretary, Mrs. Jean Balestrieri, and to my research assistant, Mr. Magnus Ahlquist.

Commercial Banking in the Late 1950s

American commercial banks are privately owned, profit-seeking enterprises. At the same time, they have a very special character. On the one hand, they accept deposits from businesses and households—money which they are required by law or custom to return to the depositor on demand or pay to some third party whenever the depositor so orders. On the other hand, in order to make a profit—which is their reason for being—they must put the bulk of this money to work, either lending it to businesses, households, or others or investing it in securities.

Obviously, no business can pay out money it does not have. Under ordinary circumstances a bank will not be expected to do so; most of the time it can count on inflows of new deposits that roughly match the amounts depositors order it to pay out, and it need keep on hand only a modest sum to cover possible excesses of outflow over inflow.

Under certain circumstances, however, the bank may be faced with a large number of depositors simultaneously clamoring for their funds. Ironically, this is most likely to happen in response to a report

or rumor that the bank is short of funds; then, virtually every depositor will try to get his money out before the till is empty.

This, of course, is the phenomenon of a run on the bank. As history demonstrates, the process can become contagious. If the failure of one bank to honor its depositors' claims leads to questions about the ability of other banks to do so, a more general bank panic can develop.

The Scope of Bank Regulation. The banking legislation in effect in the 1950s—both federal and state—had as its main purpose the prevention of bank runs and bank panics. This legislation went back to the National Bank Act of 1863—even earlier at the state level—and included the Federal Reserve Act of 1913, the McFadden Act of 1927, the Banking Acts of 1933 and 1935, and the Bank Holding Company Act of 1956. As a result of these various laws banks were subject to regulation by three federal agencies: the Comptroller of the Currency, the Federal Reserve Board, and the Federal Deposit Insurance Corporation. Other federal laws subjected them for certain purposes to oversight by the Securities and Exchange Commission and the Antitrust Division of the Department of Justice. State laws provided parallel systems of regulation, under state banking commissions, for state-chartered banks. That this complex regulatory system worked reasonably well is a tribute to the ability of the various federal and state agencies to work out cooperative arrangements among themselves.

This legislation, and the regulations issued under it, provided close control of the operations of commercial banks for the general purpose of ensuring their "safety and soundness." Three broad techniques were used by the regulators: the suppression of competition, restraints on the freedom of banks to make business decisions, and periodic examination to ensure that banks stayed within the rules and that they used in a prudent way the freedom of judgment they were allowed.

The legislation suppressed competition not only among banks but also between banks and other financial institutions. The ability of banks to compete with one another geographically was limited by rules on chartering and branching. No new bank could set up business without acquiring a national or state charter, and the authorities were disinclined to grant a charter if existing banks would suffer. State law often prohibited intrastate branching by state-chartered banks, and federal law required national banks to follow whatever rules the individual states established for state banks. Interstate branching was prohibited by federal law.

The ability of banks to compete with one another for demand

deposits was limited by a prohibition against payment of interest on such deposits. What competition there was for deposits was confined to presenting small gifts to new depositors or to omitting charges for some banking services. Banks could offer interest on time and savings deposits, which as a matter of law were not payable on demand, but the amount they could pay was limited by ceilings set under a regulation known as Reg. Q. On the other side of the ledger, the interest rate that banks could charge nonbusiness borrowers was limited by state usury laws. There was no lower limit on their loan charges, and so they could seek to attract loan business by cutting interest rates; but they did not avail themselves extensively of that option in the 1950s.

Finally, competition between banks and other financial institutions was limited by restrictions on the kinds of services each could offer. On the one hand, commercial banks were granted a monopoly on the issuance of demand deposits. On the other hand, they were not allowed to deal in corporate securities, to underwrite new corporate issues, or to engage in commercial activities.

Restraints on the freedom of commercial banks to exercise judgment took a variety of forms. There were rules regarding the volume of reserves a bank had to hold against deposits, the size of its loans to a single borrower, the amount of its investment in the securities of a single issuer, the loans it could make to "insiders"—that is, executives, directors, and stockholders of the bank—and so forth.

Periodically, banks would be visited by examiners who sought to determine whether the bank had conformed to the many applicable rules and regulations. But the examiners were also interested in determining whether the bank had made wise use of the discretion it was permitted. The examiners were concerned, for example, with the extent of loan diversification, since undue concentration of loans in a single industry or line of business could be risky. The examiners were also concerned with how well the bank's loans were "performing"; that is, whether borrowers were meeting their repayment commitments or, if not, whether the difficulty was likely to prove temporary. Elaborate systems were employed to sort outstanding loans according to the probability that they would eventually constitute losses to the bank.

While this complex regulatory apparatus increased the odds that the banks would be able to honor depositors' demands for payment, it was still deemed insufficient by concerned citizens. Hence, these arrangements were supplemented in time by a two-element "safety net."

The first element consisted of a source of funds for banks that found themselves short of cash. This source was the Federal Reserve

discount window, through which the Federal Reserve banks could make loans to commercial banks that were members of the system and, under certain circumstances, to other banks and even to other kinds of businesses. In the traditional phrase, the Federal Reserve, as the nation's central bank, served as a "lender of last resort."

The second element of the safety net consisted of federal insurance of bank deposits—time and savings as well as demand deposits—up to a stated limit, which has been raised from time to time. This insurance, it might seem, would by itself provide most depositors with enough confidence in the safety of their deposits to make unnecessary the whole elaborate structure of regulation and supervision. But that presumption overlooks the insuring agency's need for limiting the degree of risk assumed by the insured banks; since most depositors are protected from loss regardless of what the bank does, banks could be tempted to take large risks in the hope of large gains. In effect, when the government insures deposits, it must regulate banks to some degree in order to keep the claims against the insurance fund within manageable limits.

Prevailing Banking Practices. In the later 1950s banks were not chafing under the restraints imposed on them by the regulators. While many of the regulations prevented banks from exploiting opportunities for larger profits—and were in that sense onerous—the regulations that limited competition and that provided a safety net were clearly a boon. The law marked out a protected domain in which banks could profitably operate, and the banks tended to stay in that domain.

This is not to say that commercial banks experienced no competition from other types of financial institutions. That was true only with respect to demand deposits, where the banks had a complete monopoly. For time and savings deposits, commercial banks had to compete against thrift institutions—savings and loan associations, savings banks, and credit unions. On the asset side of the ledger, banks competed with savings and loan associations and savings banks for residential mortgages, with personal loan companies and credit unions for loans to households, with sales finance companies for purchase-related loans to households and businesses, and with life insurance companies for longer-term loans to businesses.

Where banks had to compete with other lenders, they had the advantage of low cost for their funds, since they paid no explicit interest on demand deposits and low interest, under Reg. Q ceilings, for time and savings deposits. In any case, in the 1950s the competition facing banks was not intense; each of the other types of financial

institution was inclined—by regulation, by provisions of the tax code, or by custom—to specialize in a particular area, leaving banks free to enjoy their own broad area.

In the later 1950s somewhat more than half of the assets of commercial banks consisted of loans: consumer credit, residential mortgages, and—most important—business loans, particularly short-term loans. Their remaining assets consisted mainly of federal government securities but also of some securities of state and local governments. The total volume of assets any bank could acquire depended on the volume of deposits it could attract locally. Banks could, however, meet rising loan demands by selling off some of their holdings of Treasury securities. The composition of bank assets thus varied over the business cycle, with loans rising and investments falling during business expansions and the reverse occurring during recessions.

The international business of commercial banks in this period was relatively minor, since foreign trade and investment were not nearly so important as they became later. The larger commercial banks in major money centers—particularly New York—maintained correspondent relations with major banks abroad and thus were able to exchange foreign currency for dollars, or vice versa, with their own customers or with the customers of their American correspondents. They also were able to assist in the financing of foreign trade. Some large banks maintained branches abroad to facilitate international business of these kinds and to provide financial services to foreign subsidiaries of American companies, and some foreign banks maintained offices in the United States for similar purposes.

All in all, the regulations of banks, together with the lighter regulations of other financial institutions, resulted in a segmented financial industry. This segmentation was reinforced by traditional practices on the part of banks and their customers. Banks were dependent for funds on deposits that came through their front doors—in part, because they did not bid for time deposits of corporations; indeed, they actively discouraged business time deposits.

Just as most banks relied heavily on their local area as a source of deposits and loan demand, so most businesses relied heavily on their local bank as a place to hold their liquid balances and as a source of loans. To businesses it was important to maintain a "banking connection." Through personal contacts over a long period, the executives of the bank became familiar with the affairs of the business and the character of the people who operated it, and for good customers they were prepared to extend credit as needed on agreed terms and with little fuss. In return, the business kept its liquid balances in an

account at the bank, including a certain fraction of any bank loans—called "compensating balances"—which it agreed not to draw upon. Moreover, businesses were not inclined to engage in what later came to be called "cash management": that is, when their demand deposits—for seasonal or other reasons—were temporarily high, they did not seek out short-term market investments on which they could earn interest. This was partly because of the relatively low interest rates available in the market, but it also reflected an active concern about possible damage to their relations with their bank.

Banks as a Conduit for Monetary Policy. Although banking regulation was originally intended to protect the "safety and soundness" of banks, certain regulations came to play an unintended but major role in another connection: the execution of Federal Reserve monetary policy, for the purpose of combating both recession and inflation. Of these, the most important was the requirement that member banks hold a given percentage of their deposits in the form of reserves, either in their deposit account with a Federal Reserve Bank or in their own vaults. Such a requirement, which goes back to the early days of American banking in the nineteenth century, might seem to be a reasonable means of raising the odds that banks could meet demands for withdrawal of deposits. But, of course, any reserves that banks are required to maintain are not available for paying out. For that purpose, banks need to hold reserves in excess of those legally required.

Nevertheless, reserve requirements proved useful for purposes of monetary policy. Whenever the Federal Reserve wanted to stimulate the economy, it had only to reduce reserve requirements—that is, to lower the percentage of deposits that member banks were required to keep in reserve. Such an action freed funds for additional bank lending or investing and thus stimulated spending by the public on goods and services. When the Fed wanted to restrain the economy, it could raise reserve requirements. In order to meet the higher requirements, banks would have to reduce their outstanding loans or investments, and that would tend to reduce the public's spending on goods and services.

While the Fed did change reserve requirements from time to time, it usually sought to influence bank lending—and thus overall economic activity—by another technique of changing the dollar volume of reserves available to member banks. It did this through so-called "open-market operations" in government securities. When the object was to stimulate economic activity, the Fed bought securities from dealers, in effect paying for them with checks drawn on itself. Each dealer's account at his bank was then credited with the proceeds,

and the account that his bank had at the Fed was simultaneously credited in the same amount. Since bank deposits at the Federal Reserve banks counted as reserves, this series of transactions increased the reserves of the dealers' banks, enabling them to expand their loans and investments. Hence, fewer loan applicants at these banks had their requests turned down or reduced; and as they spent the proceeds of their loans, other banks found their deposits increasing, enabling them in turn to expand their loans and investments.

Conversely, if the Fed's object was to restrain economic activity, it sold securities to dealers, who paid for them with checks drawn on their commercial banks. When the Federal Reserve Bank received these checks, it "collected" on them simply by debiting the deposit account of the dealer's bank at the Federal Reserve Bank. Because that reduced the reserves of the dealer's bank, that bank—besides turning down some loan applicants—had to sell some securities. This resulted in a loss of deposits at other commercial banks and therefore in a reduction of their reserves. As these effects spread through the banking system, many applicants for bank loans across the country found they were getting smaller loans than they had asked for or were being turned down completely.

The requirement that member banks hold a certain percentage of their deposits in the form of reserves thus gave the Fed a lever to expand or contract bank lending and thereby influence spending across the economy—in pursuit of the objective of economic stabilization. By restrictive actions—either raising reserve requirements or, more often, reducing the volume of reserves through open-market operations—it could force banks to contract their loans and investments, and by stimulative actions it could induce them to expand their loans and investments.

There is one more part to the story. What the bank responded to was a change in its inflow of deposits; if these slackened, for example, the bank was obliged to curtail its lending or investing, and it did not matter whether the cause was restrictive action by the Fed or some other, perhaps local, development. We have described the banks as cutting down on some loan requests or turning away some would-be borrowers. But banks could, instead, have used the more impersonal technique of raising the interest rate they charged for loans; higher rates would of themselves have induced some borrowers to scale back their requests and would have discouraged some requests altogether.

Although interest rates on bank loans to their customers did vary somewhat in the 1950s, fluctuations in customer rates were far less important than later in allocating changes in the available volume of credit. Having an eye to maintaining their most profitable long-term

relationships, banks generally preferred to make such decisions themselves rather than let the available credit go to those willing to bid the most for it. In periods of tight money banks tended to disappoint customers—often applicants for residential mortgages—of the least long-run importance to them, while they continued to serve as well as possible the credit needs of their large, most creditworthy business borrowers.

In the 1950s, then, funds flowed through relatively narrow and predictable channels because banks looked primarily to deposits as a means of funding their loans and investments, and businesses looked primarily to banks as a place to hold their deposits and get their short-term loans. Since international financial flows were relatively small in this period, the channels were confined almost entirely within the domestic economy. Consequently, by raising and lowering the sluice gates controlling the flow of reserves, the Fed could exercise a direct, quantitative influence on total domestic bank lending and therefore on national spending, with relatively small side effects on interest rates. By their lending decisions, the banks decided how the totals were to be allocated to potential borrowers. Although it may not have seemed so at the time, this was a simple system, operating in a simple financial world. Capital was not immobile, but it moved sluggishly in customary channels.

Changes in Commercial Banking through the 1970s

Since the late 1950s commercial banking in the United States has undergone remarkable, far-reaching changes. By the 1970s banks were experiencing much more intensive competition in virtually every part of their traditional business. The walls of regulation and tradition that had formerly marked banks off from other types of financial institutions had become considerably lower and more porous and at some points were entirely gone.

A number of interrelated factors account for these developments. First, with the passage of time, both banks and their larger, more creditworthy business customers discovered that their traditional practices were not necessarily in their own best interests. Second, the emergence in the later 1960s of high and variable inflation and its concomitant, high and variable interest rates, led to changes in the behavior of banks and thrift institutions, as well as of businesses and consumers in their capacities as depositors and borrowers. Third, many firms outside of banking, both financial and nonfinancial, discovered legal ways of encroaching on the business of banking; at the same time banks found ways of expanding their own domain. Fourth,

for reasons partly related to these developments, American banks began to look increasingly to foreign parts as a source of funds, as a market for loans, and as a means of avoiding the heavy hand of domestic regulation, while foreign banks turned increasingly to the United States with much the same objects in view. Fifth, under the pressure of events and the demonstrated skill of banks and their customers in avoiding the restraints of regulation, bank regulators and the Congress gave way on one front after another. Finally, onrushing technology, in the form of more rapid and reliable communications and powerful data-processing capability, transformed the world of finance by opening up a treasure chest of new cost-saving, risk-reducing, and profit-enhancing arrangements undreamt of even a decade earlier.

Some of these developments—we will presently comment on each of them—affected virtually all banks in the country, from the smallest community bank to the great money center institutions operating in worldwide markets. Other changes, especially those with an international dimension, were concentrated in the large institutions. But some trends that originated at large banks worked their way down the size structure and may ultimately become general.

Learning by Banks and Businesses. A quarter of a century ago, in the early 1960s, the larger, more creditworthy corporations were beginning to learn that they often could meet their short-term credit needs more cheaply by selling commercial paper to other companies, to pension funds, and to other organizations with temporarily idle cash rather than by borrowing from banks. To be sure, the assistance of banks was still needed; in order to get a high credit rating, commercial paper ordinarily had to be backed by a bank line of credit—but this assistance was forthcoming. Also, particularly after interest rates began their extended rise, many businesses discovered the merits of "cash management." Instead of letting their deposit balances at banks rise and fall with variations in their receipts and payments, they undertook to keep cash at the minimum required for efficient operations and to invest temporary surpluses in interest-earning money market instruments.

For their part, banks made the monumental discovery that their outstanding loans and investments need not be constrained to whatever volume of deposits happened to come their way. Rather, they could attract the funds they wished by issuing negotiable certificates of deposit (CDs) at competitive interest rates, provided the rates offered did not exceed the prevailing Reg. Q ceilings. Banks also learned to stretch their available resources by borrowing "federal

funds" from one another; these consisted of deposits that banks held at Federal Reserve banks as well as deposits of other financial entities that were accorded this privilege.

These and other fund-raising devices, which came to be known as "liability management" by banks, had far-reaching consequences. The practice of liability management brought to an end an era during which bank lending rates were relatively inflexible, when interest rates played a relatively small role in the allocation of credit among would-be borrowers, and when Federal Reserve monetary policy worked mainly through the allocation of credit by commercial banks on the basis of the volume of reserves supplied by the Fed. In the new era banks were free to "buy" lendable funds in the market; they lost no time in doing so and in aggressively searching out profitable ways to employ their funds at home and abroad. A corollary of the new freedom of banks to expand their assets was the loss of the old freedom to hold loan rates relatively steady; for when banks paid higher interest rates for the liabilities they purchased, they in turn had to charge higher rates on the loans they extended. In this environment of more flexible interest rates, the channel through which monetary policy affected the nation's overall spending shifted from credit allocation to interest rates—that is, from decisions by banks whether to grant borrowers' requests for loans to decisions by borrowers whether to accept loans that banks were willing to grant at the interest rate asked.

Consequences of Inflation and Rising Interest Rates. In the early 1960s, when banks were beginning to tap the negotiable CD market in volume, the Federal Reserve accommodatingly raised the Reg. Q ceiling rate on CDs whenever it began to bind. But by 1966 circumstances had changed; inflation was accelerating, monetary policy was shifting toward restraint, and short-term interest rates were moving up briskly. Along with other regulators, the Fed became concerned that continuing rapid sales of CDs by banks would lead to large deposit outflows from thrift institutions and thereby damage the housing industry, which depended heavily on the thrifts for its financing. Accordingly, the Fed departed from earlier practice and kept the Reg. Q ceiling on negotiable CDs unchanged. (At the same time, to prevent thrifts from engaging in a bidding war, Reg. Q was applied to their deposits.) The action—or better, inaction—by the Fed crimped the ability of banks to finance a growing volume of loans, since the rates they could offer on CDs had become less competitive with rates on other market instruments available to investors. In these circumstances banks found it necessary to ration loans, and many well-

established firms were forced to find new sources of funds. A large number of these firms turned to the commercial paper market, and many continued to use that market even after bank loans were again readily available.

Meanwhile, a cat-and-mouse game ensued between banks and the Fed: banks sought to secure funds free of regulatory controls, and the Fed tried to block or at least blunt their efforts. Many banks turned to the Eurodollar market, establishing overseas branches which collected deposits free of regulatory restraints and lent them to their head offices at home for relending to businesses and other customers. Banks used this device extensively during 1969, the next period of severe monetary restraint. The Fed responded in two ways: by imposing marginal reserve requirements on head office borrowings from overseas branches and by exercising "moral suasion"—that is, urging banks not to use their offshore branches as a means of avoiding domestic monetary control.

Banks gained access to another source of funds by restructuring themselves into one-bank holding companies. Prior to the 1970s the Fed's statutory authority over holding companies extended only to those that owned two or more banks. Thus, a one-bank holding company could raise funds in the commercial paper or other markets free of regulatory restraints and then use these funds to help finance loans by its subsidiary bank. In 1970 the Fed finally succeeded in a long effort to get legislation extending its authority to one-bank holding companies, whereupon it applied reserve requirements to funds that banks obtained from their parent holding companies.

A third device employed by banks was to sell securities to large corporate depositors under an agreement to repurchase the securities later—thus wiping all or part of the customer's deposit and its associated reserve requirement off their books for a time. Since these "repurchase agreements" were not subject to Reg. Q ceilings, they enabled banks in effect to pay interest on demand deposits and accordingly were welcomed by substantial depositors. By continually rolling over the repurchase agreements, banks were able to maintain a larger loan volume than otherwise. Initially banks used a variety of assets in these arrangements, but in 1969 the Fed ruled that only Treasury and federal agency securities could be used; otherwise it did not attempt to stop the practice.

Shortly thereafter—at the time of the Penn Central crisis in 1970—the Fed relaxed its pressure on banks by suspending Reg. Q ceilings on short-term negotiable CDs, and three years later it suspended the ceilings for negotiable CDs of any maturity. Although this particular struggle between the Fed and the banks it regulated thus

came to an end, several of the practices introduced in its course remained permanent features of the banking scene—among them, the use by domestic banks of the one-bank holding company form of organization, their extensive reliance on repurchase agreements to augment lending resources, their maintenance of numerous foreign branches, and the application by the Fed of reserve requirements to head office borrowings from branches.

The experience of inflation and rising market interest rates led consumers, as well as businesses, to become increasingly concerned with the yields they could earn on their deposits. But most consumers had few alternatives to time and savings deposits at banks and thrift institutions. Negotiable CDs, which the Fed freed from interest rate constraints in the early 1970s, were issued only in denominations of $100,000 and up and thus were not available to most household depositors. As long as Reg. Q ceilings were maintained on ordinary time and savings deposits, consumers had little opportunity to benefit from the rising market interest rates that accompanied accelerating inflation—until money market mutual funds, which emerged in 1972, became widely accepted as a practical equivalent of bank deposits. These funds—as well as many stock and bond mutual funds—offered check-writing facilities, although there was usually a minimum, typically $500, to the size of checks. Thus, after 1972 small depositors could share in the privilege of earning a market rate of return on their liquid balances, although they had to give up the protection of deposit insurance—since mutual funds are not insured. Incidentally, since money market mutual funds invested heavily in commercial paper, their growth provided a substantial lift to the market for such paper.

Market interest rates fluctuated above and below Reg. Q ceiling rates during most of the 1970s; but in 1978 market rates rose sharply, and the regulators of both banks and thrift institutions moved quickly to prevent heavy deposit runoffs. Both types of institutions were permitted to issue six-month "money market certificates," yielding market rates of interest, in denominations of $10,000 or more, and banks were authorized to offer customers "automatic transfer services," under which funds in savings accounts were shifted to demand deposits as necessary to cover checks. At about the same time, banks and thrifts in New York state were permitted to offer "NOW" accounts, under which checks—called negotiable orders of withdrawal—could be drawn against interest-earning savings accounts; NOW accounts had already been available in the six New England states for a few years. A little later, at the beginning of 1980, banks were authorized to issue thirty-month "small savers certificates" of any size paying market interest rates.

Throughout this period of spasmodic movement by bank regulators toward deregulation, there were continuing calls for more comprehensive action by Congress. The response finally came in 1980 in the form of the Depository Institutions Deregulation and Monetary Control Act. Commercial banks had already lost their complete monopoly of transactions accounts, and this act drove another large hole through the banks' monopoly—by authorizing thrift institutions as well as commercial banks to issue NOW accounts. In addition, the act permitted banks to compete among themselves and with thrifts for time and savings accounts by providing for a six-year phase-out of Reg. Q interest rate ceilings. It also reduced the regulation-based differences between banks and thrift institutions by broadening the asset powers of the thrifts, applying identical and simplified reserve requirements to both types of institutions (phased in over an eight-year period ending in 1987), and giving thrift institutions access to Federal Reserve services—including the discount window. Moreover, the act repealed state usury ceilings on mortgage interest rates and relaxed these ceilings on other rates. Two years later, the Garn–St Germain Depository Institutions Act further broadened the asset powers of thrift institutions. That act also authorized banks and thrifts to establish "money market deposit accounts," which could offer yields competitive with those on money market mutual funds and had the additional attraction of being insured. Not surprisingly, they proved to be enormously popular.

The experience of inflation and of high and volatile interest rates had still other effects on financial markets and practices. The wide fluctuation of interest rates in 1973 and 1974 was followed by the development in 1975 of a market in financial futures, which enabled participants to hedge against interest rate fluctuations. More important, the generally high average level of interest rates provided a continuing incentive to businesses and individuals to engage in cash management. More and more businesses sought to invest temporarily idle funds in interest-earning money market instruments—such as commercial paper, Treasury bills, CDs, and repurchase agreements, while more and more individuals became actively concerned about their earnings on transactions and savings balances. These tendencies increased with every surge in rates, but they did not dissipate when rates fell back; once learned, the practice of cash management tended to endure.

Similarly, borrowers became more sensitive to the rates they paid for credit. One consequence was a more or less steady increase during the 1970s in the number of business borrowers who shifted from banks to the commercial paper market, where interest rates for prime

borrowers were generally below rates charged by banks. Banks continued to facilitate this process by providing backup lines of credit to commercial paper issuers. Indeed, beginning in the early 1970s they went further; they helped many smaller, less well-known firms gain access to the commercial paper market by providing them with letters of credit that formally guaranteed repayment of the paper they sold. This was an early extension of the fee-generating "off-balance-sheet" activity by banks that was later to become so important.

The accelerating pace of inflation and the spreading practice of cash management had another implication for banks, relating to the way they priced their business loans. In the 1950s banks made only limited use of floating-rate loans and then almost exclusively for longer-term loans. In the 1960s, when the era of liability management began, banks expanded the use of floating rates for business loans of all maturities. Under a floating rate it is, of course, the borrower who bears the risk of a rise in interest rates during the term of the loan. Floating rates were therefore particularly attractive to banks and other lenders as interest rates moved higher and became more volatile during the 1970s.

For many years it was the general practice of banks to relate the interest charge on a floating-rate loan to their prime rate, which was the interest rate charged to their most creditworthy business customers. However, since the prime rate was changed rather infrequently, there were long intervals in which it tended to be out of line with market rates. In a world in which banks were paying market interest rates on a rapidly growing proportion of their deposits, a relatively low prime rate put pressure on their profit margins. And in a world in which the securities market was a beckoning alternative, a relatively high prime rate induced many borrowers to shift from banks to the securities market. One response to this problem was for banks to keep the prime rate more closely aligned with market rates; hence banks began to change the prime rate more frequently in the 1970s. Another response was to set the loan rate in terms of a markup over a specific market rate instead of the bank's prime rate; in recent years banks have tended to use this technique for large loans to their most creditworthy borrowers. The prime rate remains important, however, for smaller loans and generally for loans by smaller banks.

Growing Competition with Other Financial Institutions. Commercial banks have become subject to increasing competition from investment banks and other financial institutions as a result of the growth of "securitization"—a process that consists of the substitution of marketable securities for the traditional bank loan, either when the borrow-

ing is first arranged or at a later point. This process originated with the emergence of the commercial paper market, gained strength during the 1970s, and has been growing rapidly since then. In most of its forms it involves the active role of an investment bank—although, as in the case of commercial paper, commercial banks may also play a role in the process.

One new form of securitization was foreshadowed in 1972 when some finance companies began to issue medium-term notes—securities with maturities longer than those on commercial paper but shorter than those on bonds. In the late 1970s investment banks became active in the market for so-called "junk" bonds. In this market firms with relatively low credit ratings, which ordinarily would have borrowed from banks or arranged private placements with insurance companies, began to make public issues of low-rated or unrated bonds. Both of these practices expanded sharply in the 1980s.

So too did a rather different form of securitization, involving the sale of interests in a package of loans originated by a bank, thrift institution, or other organization. This practice began in 1970, when the Government National Mortgage Association developed "Ginnie Mae pass-throughs"—that is, the sale of ownership interests in a bundle of its residential mortgages. The practice grew rather rapidly during the 1970s, as other government and private entities undertook similar programs with home mortgages. In the 1980s it was extended to mortgages on commercial real estate and to other forms of credit, including auto loans and credit card receivables.

The 1970 amendments to the Bank Holding Company Act also served to intensify competition between commercial banks and other kinds of financial and nonfinancial firms. As noted earlier, these amendments expanded the Fed's authority over holding companies to cover the one-bank as well as the multibank variety. Besides permitting the Fed to close a large hole in its net of regulatory restraints, they had two important effects on the competitive environment of banking.

First, the legislation defined the activities in which affiliates of bank holding companies could engage as those "so closely related to banking . . . as to be a proper incident thereto." While this language greatly restricted the range of permissible activities for one-bank holding companies—which previously had been unregulated—it was broader than the range that formerly applied to multibank holding companies. Shortly after the amendments were passed, the Fed issued a short list of authorized activities, and from time to time since then it has added to the list. Bank holding companies are now authorized to compete with nonbanks in about two dozen activities, includ-

ing mortgage banking, discount brokerage services, financial counseling, and data processing services.

Second, the 1970 legislation formally defined a bank as an institution that both accepts demand deposits and makes commercial loans. This definition implicitly permitted firms in other lines of business to acquire banks and, by spinning off either their deposit-taking or their commercial loan operations, to carry on the remaining activities free of the regulatory restraints that apply to the activities of banks. Beginning in the 1980s, many kinds of businesses, both financial and nonfinancial, have breached the wall that formerly protected banks from outside competition by creating these so-called "nonbank banks."

Growing International Competition. By the late 1950s postwar reconstruction in Europe and Japan was completed, the external convertibility of currencies was widely restored, and earlier restrictions on international capital movements were relaxed. These developments, together with progressive reductions in tariff barriers and declines in the cost of transportation, resulted in considerably faster growth of international trade than of world output. Foreign direct investment also grew rapidly—largely as a consequence of the prominence that transnational corporations had acquired in an increasingly interdependent world.

These developments led to a remarkably rapid growth of international banking, in which American banks have extensively participated since the early 1960s. As American businesses became more active in foreign trade, our banks found increasing profit opportunities to serve their needs by providing trade financing and by buying and selling foreign exchange—a routine activity involving little risk before the shift to flexible exchange rates in the early 1970s. Banks also supplied services, often through the branches they established in foreign countries, in connection with the direct investments of our firms abroad and their growing international activities. These branches found additional profit opportunities by becoming increasingly involved in the financial markets of foreign countries and in the Eurodollar market, often in direct competition with domestic banks of the country in which they were located.

The term "Eurodollar market" originally applied to deposits and loans denominated in U.S. dollars at banks—including branches of American banks—located in Europe, mainly London; but this term has now come to mean dealings in dollars in any market outside the United States. It was the first of a series of analogous terms, applying to foreign markets for different kinds of dollar assets (for example, the

Eurobond, Euro–commercial paper, and Euro-equity markets) and to markets away from home for other currencies (for example, the Euro-yen market). The Eurodollar market began operating in a small way in the 1950s, but it was given a boost along with the Eurobond market by our government's effort in the early 1960s to deal with an emerging balance-of-payments problem through capital controls. These controls included the so-called "interest equalization tax" on foreign borrowings of dollars in the United States and a "voluntary foreign credit restraint program" for banks that was administered by the Fed. One consequence of these controls (the last of which was removed in 1974) was that many foreign entities that wanted to borrow dollars sought them from banks and other financial institutions outside the United States—including, of course, the foreign branches of our banks—to the benefit of the volume of dollar banking done abroad.

During the 1960s, when large American banks were establishing branches overseas, many banks too small to afford branches complained to the Fed that they were being unfairly excluded from a useful source of funds and, more generally, from a potentially lucrative market. In response the Fed permitted them, and larger banks as well, to open "shell" branches in the Caribbean—perhaps involving nothing more than a post office box—through which they could conduct a foreign banking business free of regulatory restraints.

In the later 1960s the Eurodollar market was given another large boost by the Fed's efforts to limit the ability of our commercial banks to raise funds from foreign sources. As previously noted, when banks turned to the Eurodollar market, the Fed sought to close off that source by imposing marginal reserve requirements on their Eurodollar borrowings and by applying moral suasion. Still, many of our banks came out of that experience owning brick-and-mortar branches in London and other foreign locations, with shell branches in the Caribbean, and possessing greater familiarity with foreign banking regulations and practices—which they put to good use. One practical use was to avoid domestic regulations on such matters as reserve requirements, interest rate ceilings, and deposit insurance by executing transactions with American corporations through the banks' foreign branches rather than through their banking offices in this country.

The foreign branches also facilitated participation by our banks in the burst of international lending that was precipitated by the enormous increases in oil prices in the 1970s. The OPEC nations, finding themselves with more funds than they could spend, deposited huge sums in the Eurodollar market as well as in the head offices of our international banks. Meanwhile, many oil-importing countries, faced

with payments in excess of their financial capacity, needed a source of foreign loans. Our and other international banks, including their foreign branches, stepped into the breach by "recycling" the deposits of oil exporters through loans to oil importers.

Apart from the oil importers, the less-developed countries (LDCs), particularly in Latin America, sought massive loans from European and Japanese as well as American banks. In the 1970s, when commodity prices—including oil prices—were high and rising, loans for developmental projects looked secure. Banks in the United States and other industrial countries, often possessed of more funds than they could profitably employ at home, were attracted not only by current profit possibilities in the LDCs but also by the potential for long-term customer relations. In fact, some of our banks actively encouraged borrowing by foreign governments—in part because of an illusory feeling that sovereign borrowers could not fail to meet their financial obligations. Most American bank loans to the LDCs were floating-rate loans of intermediate term, and the repayment record was actually excellent for a time. But a combination of unfortunate developments—worldwide recession, collapsing markets for internationally traded commodities, and sharply higher interest rates—set off in 1982 the international debt crisis that remains with us today.

During the 1970s the expansion of American bank activity in foreign financial markets was paralleled by an expansion of foreign bank activity in our country. Foreign banks established offices here—usually by buying an American bank or opening branches or agencies—for much the same reasons that prompted our banks to go abroad; that is, to provide financial services to business firms from their home country and to compete with domestic banks in our financial markets. The United States was particularly attractive to branches and agencies of foreign banks because of the regulatory situation that prevailed before enactment of the International Banking Act of 1978.

Federal Bank regulators had traditionally made a sharp distinction between subsidiaries of foreign banks on the one hand and branches and agencies on the other. Subsidiaries, which were chartered in the United States and considered to be distinct banking entities, were subject to the same rules and regulations as applied to any of our domestic banks. Until 1978, however, branches (and agencies, which differ from branches in not being authorized to accept deposits from American residents) were viewed as extensions of the foreign parent bank and were subject only to state regulation. Thus, branches and agencies of foreign banks were free of federal rules on reserve requirements and Reg. Q interest rate ceilings as well as of

federal prohibitions against interstate branching and the underwriting of corporate securities. By the same token, branches and agencies were not eligible for federal deposit insurance and did not have access to Federal Reserve services.

All this was basically changed by the International Banking Act, which extended to branches and agencies of foreign banks the responsibilities and privileges that applied to domestic banks. One exception related to the nonbanking activities prohibited by the Bank Holding Company Act, and another related to the underwriting of corporate securities prohibited by the Glass-Steagall Act. Under a grandfather clause, branches and agencies of foreign banks were permitted to continue any such activities in which they were already engaged.

The rules governing international transactions were changed in another way in 1981 when the Federal Reserve authorized domestic banks to establish "international banking facilities," or IBFs. Before this action domestic banks wishing to do deposit or lending business with foreign residents of the United States had to rely on their foreign branches in order to avoid subjecting these transactions to domestic reserve requirements and interest rate ceilings. Under the rules for an IBF, banks located in the United States—including branches of foreign banks—can now accept deposits from and make loans to foreign residents free of all domestic regulatory requirements as long as the bank maintains a separate set of accounts for these activities. The earlier diversion of this type of banking business from New York City and our other money centers was thus made unnecessary by the authority to establish IBFs. The Caribbean shell branches, however, were still useful for avoiding regulatory restraints on dealings between our banks and American citizens—and many still function today.

Deregulation of Banking Markets. The trend toward deregulation of our banking markets might be said to have begun in 1970, when the Fed removed Reg. Q ceilings from negotiable CDs of short maturity at the time of the Penn Central crisis. A better date is 1973, when ceilings were removed from negotiable CDs of all maturities and—more important—when this country and others shifted from fixed to flexible foreign exchange rates. The trend continued in 1974, when the "voluntary foreign credit restraint program" and other capital controls dating from the mid-1960s were discontinued, and over the rest of the decade as banking regulators made one concession after another to market pressures on deposit interest rate ceilings.

During this period and into the 1980s another kind of regulatory

barrier—that limiting competition on a geographic basis—also began to give way before market pressures. Many large banks established "loan production offices" outside their home states. Technically, these offices do not engage in banking; their function is to arrange for the home office to make the loan or accept the deposit, but the practical difference may not be great. Many bank holding companies also acquired or established nonbanking subsidiaries in other states, and many have recently used the nonbank bank device to carry on some kinds of banking business out of state. Increasingly, banks have come to share interstate networks of automatic teller machines (ATMs) through which their customers can carry out a variety of banking transactions across state lines. By advertising and distributing their credit cards throughout the country, some banks have also been able to operate in a national consumer credit market.

Furthermore, an impetus to deregulation has also come from state governments, which sought, among other reasons, to attract capital for economic development and to facilitate takeovers or mergers of troubled banks and thrift institutions. Many states have thus lowered their barriers to entry of banks owned by out-of-state holding companies. These actions speeded up after a Supreme Court decision in 1985 that approved compacts confined to a regional group of states.

Onrush of Technology and Financial Innovation. Along with many other economic activities, banking was converted during recent decades from a labor-intensive to a capital-intensive activity by the advent of the computer. Continuing technological advances in computers and communications have steadily reduced the cost of carrying out transactions, maintaining records, and performing other functions required in the conduct of banking. But advances in technology have done more than this; they have also made possible operations and functions that previously were impossible. More than anything else, financial innovation, riding on the back of technological advance, has transformed the nature of banking and of the financial services industry generally.

Thus, the Clearing House Interbank Payments System (CHIPS), which was activated in 1970 to facilitate the rapid international transfer of funds, has proved to be critically important to the development of the Eurodollar market. Similarly, transactions in U.S. government securities could never have reached their present gigantic proportions without an electronic wire system such as the Federal Reserve banks operate. Monetary payments generally have been enormously speeded by the use of electronic transfers rather than the sending of

paper through the mails. Money market mutual funds for ordinary citizens would not have been possible without computers capable of handling an enormous volume of relatively small transactions. Computer and communications technology facilitated cash management by large corporations and the securitization of mortgage loans, besides the massive trading in government securities and various other developments of the 1970s. But technology and financial innovation did not reach their full flowering until the 1980s.

Banking during the 1980s

Banking Situation at Beginning of Decade. In the late 1950s commercial banking in the United States was largely a domestic—and often an entirely local—business; competition was limited by regulation; and banking practices were governed by traditional relations with customers and the dictates of bank supervisors. By 1980 banking had changed fundamentally. In the new era banks found themselves competing vigorously at home and abroad for the business of depositors and borrowers who were becoming more sophisticated, whose needs were growing more complex, whose options for meeting their needs were continually expanding, and whose decisions were now likely to turn on fractions of a percentage point in interest rates rather than on number of years of personal acquaintance.

Commercial banks found themselves competing vigorously not only with other domestic banks and thrifts but also with investment banks, finance companies, and other financial institutions. The large money center banks were also locked in competition with banks abroad and with their subsidiaries and branches in this country. Much of the competition still involved traditional banking—the taking of deposits and the making of loans. Much, however, also involved activities formerly prohibited to banks but now permitted to banking organizations that used the holding company form—as the great majority were doing by 1980. And an increasing part of the competition involved services of a kind practically unknown a quarter-century earlier—services that had been found useful to participants in financial markets.

Besides facing more intense competition, American commercial banks, along with the rest of the financial services industry, were caught up by 1980 in processes of securitization and globalization. Banks of all sizes had begun in the 1970s to securitize loans by disposing through Ginnie Mae and similar pass-through programs of many residential mortgages that they had previously originated and often still continued to service. Large banks were going global by

aggressively pursuing business in the Eurodollar market and by lending in heavy volume to the LDCs. Money center banks were introducing many smaller banks to the attractions of global banking by selling them participations in their foreign loans. At the same time, many domestic borrowers began to securitize by shifting from banks to domestic securities markets as a source of funds; many large borrowers looked for their financing to banks abroad as well as here; and the largest and most creditworthy firms began to securitize on a global scale by shifting from banks or from domestic securities markets to international securities markets.

For American commercial banks, particularly the larger banks, these developments meant substantial changes in the kind of activities in which they engaged and in the kind of loans they carried on their books. These developments also meant a shift of a part of their income from interest on assets to fees for off-balance-sheet services. This kind of shift can be a matter of choice, as when a bank securitizes its residential mortgage holdings. But when a bank loses a creditworthy borrower to the securities market, the decision is usually the borrower's. Moreover, the bank so involved is not even assured of compensation in the form of fees, since the borrower may look elsewhere for any needed backup line of credit or for other services ancillary to the security issue.

Along with these changes in assets and earnings, there also were substantial changes on the liability side of bank balance sheets. Most important, interest-free demand deposits were relatively much less important to banks than they had been a quarter-century earlier, first, because households had converted a large proportion of their liquid balances into interest-earning form at banks, thrifts, and money market funds and, second, because business firms were striving increasingly to keep their demand deposit balances at the lowest levels consistent with efficient operations. The relative decline in demand deposits meant not only that banks were losing a stable, low-cost source of funds; it also presented the prospect of growing uncertainty about the future cost of funds—whether raised through the domestic CD market, through the Eurodollar market, or in other ways.

The Economic Environment of the Eighties. The major trends affecting commercial banks—increasing competition, securitization, and globalization—accelerated in the 1980s. The driving forces were essentially the same as earlier, but their accelerated pace and particular forms need to be viewed against the background of the great economic and financial tides that have swept the globe in this decade.

As the 1980s opened, inflation rates and interest rates, under the

stimulus of the second oil price shock, were soaring everywhere, and the dollar was still dropping on the foreign exchanges. The Federal Reserve and the central banks of other major industrial countries sought to contain the surging inflation with tight monetary policies, and during 1981–1982 the world experienced its worst general recession since World War II. Meanwhile, in a remarkable experiment with fiscal policy, the United States sharply reduced federal tax rates without making commensurate reductions in federal budget expenditures. The American economy recovered briskly until mid-1984 and has continued to expand since then—although at a sharply reduced rate—and it has been characterized of late by industrial and regional differences in performance that are proving troublesome.

The developments of the early 1980s set processes in motion that are still continuing. Tight money and the worldwide recession induced by it broke the galloping inflation—at least for the time being. Massive budget deficits in the United States helped to keep domestic interest rates, which had begun to descend from the extraordinary peaks reached in 1981, at a relatively high level. These high interest rates along with renewed confidence in our economy and our currency attracted funds from all over the world and led to the largest and longest rise in the external value of the dollar since exchange rates had begun to float in the early 1970s. The sharp appreciation of the dollar triggered a surge in imports, a fall in exports, and a resulting huge deficit in our international current account, which in just a few years has succeeded in reversing the external position of the United States from the world's largest creditor to the world's largest debtor.

The world economy taken as a whole has recovered—although rather sluggishly—from the deep recession of a few years ago. Many Latin American and African countries nevertheless remain depressed. Inflation has remained subdued in the United States and other industrial countries, and interest rates around the world have been trending downward. In the past two years the foreign exchange value of the American dollar has largely reversed its earlier long run-up. The deficits in our federal budget and current account still remain enormous, and real interest rates—that is, market rates less the prevailing inflation rate—are still fairly high by historical standards.

The huge federal budget deficits of recent years have been accompanied by a dramatic increase of debt on the part of business firms, state and local governments, and households. In the quarter-century prior to 1980, the aggregate of public and private indebtedness roughly paralleled the growth of the gross national product, so that, except for minor fluctuations, the ratio of the former to the latter was practically constant. The sudden explosion of this ratio since 1980 is

perhaps the most arresting, if not also the most worrisome, feature of our credit markets in recent years; for it may spell serious trouble for both borrowers and lenders in the event of an early business recession.

To be sure, more or less comforting explanations can be cited for the rapid growth of debt in individual economic sectors. For example, while business borrowing has of late been considerably larger than needed for financing investment in fixed capital and inventories, much of the total has been used to finance the heavy volume of equity retirements associated with the ongoing wave of mergers, acquisitions, leveraged buyouts, and share repurchases. Again, state and local governments have recently resorted for a variety of reasons to heavy anticipatory borrowing and then relent the funds that they did not immediately need. But despite these and other special explanations, some common factors probably underlie the rapid and widely diffused expansion of debt during the 1980s—among them, the greater accessibility of credit, the greater variety of repayment options, perhaps also expectations of some renewed inflation, and a fundamental change in the attitudes of people toward debt. In any event, it is entirely clear, first, that the massive federal deficits of recent years are not the only cause of our heavy reliance on foreign capital and, second, that the debt explosion of the 1980s—and the decline in the quality of debt that seems to have accompanied it—urgently require thorough empirical investigation.

The Banking Environment of the Eighties. The wide swings in overall production in our country since 1980, combined with the sharp slowing of inflation—indeed, with actual declines in many commodity prices—and high real interest rates, created grave difficulties for many market participants who had borrowed heavily from commercial banks during the 1970s in the expectation that economic growth and inflation would remain rapid. Domestically, these participants were mainly in the farming, energy, and commercial real estate sectors; abroad, they were governments and private firms in LDCs, particularly in Latin America. The disappointed expectations that created problems for borrowers in servicing their loans in turn created problems for their banks. Indeed, they resulted in the highest rates of bank failure since the Great Depression of the 1930s, besides a reduction in the credit ratings of many solvent banks—including some of our nation's largest. And serious though the problems of some commercial banks have been, the problems of thrift institutions have, on the whole, been still worse.

The great majority of our commercial banks, however, have re-

mained financially sound, have managed to strengthen their capital positions, and have responded in many other ways to the opportunities as well as the difficulties brought on by an unstable economic environment. Earlier there had been a heavy flow of international credit to the LDCs. This was partly in the form of a recycling of surplus OPEC funds to oil-importing LDCs in which American banks actively participated. The recycling process ended in 1982 with the disappearance of OPEC's surpluses and of the capacity of many LDCs to service debt on schedule. Earlier also, there had been a heavy flow of development loans to LDCs—both to importers and exporters of oil—from European and Japanese as well as from American international banks. This was succeeded in the 1980s by a new process in which American banks repatriated funds from abroad, while financial institutions and individuals in Europe, Japan, and other countries poured funds into the United States. With interest rates still relatively high and fluctuating widely and foreign exchange rates also increasingly volatile, the forces that impinged on commercial banks during the 1970s intensified during the turbulent 1980s. Great strides toward meeting efficiently the demands of the marketplace were thus necessary and were in fact made by commercial banks in response to continuing deregulation and technological advances, as well as through bold innovation in financing arrangements.

The trend toward financial market deregulation continued apace in the United States during the 1980s, and it spread rapidly to other industrial countries. Some of the measures taken abroad, like those taken here, amounted to bowing to the inevitable; once market participants found ways around existing regulations, it was useless and often counterproductive to leave those regulations in place.

But other factors were also at work. Financial market deregulation was consistent with the philosophical preference of newly elected conservative governments in the United States, the United Kingdom, and Canada—and more recently France—for free markets generally. Moreover, the government of the United States, even more than that of other industrial countries that were running budget deficits, had a financial interest in facilitating purchases of its obligations by foreign lenders. Consequently, legislation was passed in 1984 that repealed the 30 percent withholding tax on foreign earnings of interest on securities issued here; this legislation also authorized federal and other issuers to offer bearer securities to foreign investors, in place of the registered form required for issues to domestic investors. In addition, our government exerted pressure on some countries—most importantly Japan—to remove constraints on purchases of foreign securities by their nationals.

Whatever the reasons for particular deregulatory measures, they

resulted in greater mobility of capital both within countries and across borders. The appearance of new competitors in formerly isolated markets has had its usual effect of lowering costs and prices. More generally, the reduction of governmental barriers to the flow of funds appears to have resulted in more efficient financial markets, simultaneously reducing costs to borrowers and raising returns to ultimate lenders.

Powerful advances in technology reinforced the effects of deregulation. They permitted information about beckoning business opportunities to travel with ever greater speed to more and more places. In fact, improvements in telecommunications have by now made possible the virtually instantaneous spread around the world of the terms on which many investments can be made or funds can be raised. Moreover, speedier communication and increasingly sophisticated computers have enormously reduced the cost of arranging the best terms on which financial transactions can be consummated. Modern technology has thus linked what formerly were many separate financial markets into an integrated world market—although obstacles still remain, particularly in the case of equities.

Computers have continued to play a major role in revolutionizing financial markets. Without these technical aids it would have been extremely difficult—perhaps even impossible—to design some of the financial devices that are now extensively used by commercial banks, investment banks, and other financial intermediaries. It would have been even more difficult to decide what fees or other charges should be required. And it would have been virtually impossible for an intermediary to monitor its own exposure to various types of risk as market conditions changed during the day and as contracts in one stream were being terminated while those in another stream were being initiated.

In addition to deregulation and technology, financial innovation has been a powerful force in facilitating financial arrangements and integrating capital markets around the world. In recent years, brilliant technicians at investment and commercial banks have been devising new—and often exotic—financial instruments at a pace that dazzles the imagination. In his recent book, *Interest Rates, the Markets, and the New Financial World*, Henry Kaufman lists thirty-seven different credit instruments that were introduced or became widely used in the single year 1985. The best known of the recent innovations are note issuance facilities, currency and interest rate swaps, currency and interest rate options, and forward rate agreements. It will have to suffice for our present purpose to describe the "currency swap"—one of the simplest of these novel instruments.

Let us suppose that an American firm contemplates a financial

investment in Frankfurt, to be funded by dollars borrowed in the United States and then converted to marks at the going exchange rate. The firm concludes that after the expected returns in marks are converted back to dollars the investment will yield an acceptable profit—unless the mark weakens against the dollar in the interim; but if the mark should weaken, the mark yield of the investment would be convertible into fewer dollars, thus reducing the dollar profit and perhaps resulting in a loss. This firm obviously faces "currency risk."

A traditional method of coping with currency risk is to engage in a forward transaction—that is, to enter into a contract now to sell a foreign currency at a specified exchange rate on some designated future date or dates. But forward contracts typically are available for relatively short periods and could not easily be arranged to cover all of an expected income stream extending, say, five or ten years into the future.

Another possibility for the American firm would be to finance the mark investment with a loan in marks, arranged with a German bank. If, however, the American firm is not well known in Germany, it is likely to be charged a considerably higher interest rate than it would have to pay on a dollar borrowing arranged in the United States—thus reducing and perhaps eliminating any hoped-for profit. What the American firm would therefore like to do is to finance the mark investment in dollars, in order to benefit from a lower interest charge, and later repay the loan out of the mark proceeds of the investment, in order to avoid the currency risk involved in converting the proceeds of the investment from marks to dollars. Here is where the "swap" comes in. What is needed is a "counterparty" in approximately opposite circumstances—say, a German firm contemplating an investment in the United States, which can borrow more cheaply in Germany than in this country. Under the swap procedure, each firm will borrow in its own country, at the lower rate available to it there. The two firms will then agree to exchange their repayment obligations—that is, the American firm will provide the German firm the marks the latter needs to make its repayments, in exchange for the dollars the American firm needs for the same purpose. Through such an arrangement worked out by a financial intermediary, both companies will be freed of currency risk, and the intermediary will also earn a fee.

By removing the currency risk on borrowings for international investments, such swaps make feasible many undertakings that would not otherwise take place. The swap process is capable of, and is undergoing, seemingly endless elaboration. Another important variety—the interest rate swap—permits market participants to exchange

interest payments from a fixed-rate form to a floating-rate form. A combined variety—the cross-currency interest rate swap—simultaneously involves both types of exchanges, for example, of a fixed-rate mark obligation for a floating-rate dollar obligation.

Of late, commercial and investment banks have been busily engaged in arranging all sorts of swaps—a financial arrangement that by now has assumed a very large role in international banking. They earn fees by bringing the counterparties to the swap together. They often earn additional income by arranging the underlying financing for the parties to the swap. And an investment or commercial bank may at times act as the counterparty itself, perhaps arranging an offsetting swap with another counterparty at a later time. In the words of one prominent investment banker, "Currency and interest rate swaps . . . have enabled market participants to link all of the major capital markets of the world together. No doubt this single innovative technique has been a major force in the trend toward globalization of markets."

Recent experience indicates that once a financial innovation is introduced by a banking firm, it is soon adopted also by one or more of its competitors. In view of the ease with which innovations spread, financial intermediaries need to keep creating new devices in order to maintain their competitive edge. That they recognize this is indicated by the impressive number of institutions that have established "product development" departments. That, together with the demonstrated ingenuity of the designers in coping with the endless variety of circumstances facing business and financial firms, probably means that the pace of innovation in domestic and international financial markets will remain rapid for some time to come.

Varying Adjustments of Individual Banks. The sophisticated financial devices on which we have just dwelt are as yet largely the province of money center banks and their aggressive competitors in investment banking. Regional commercial banks and local banks have different concerns. For those that have been heavily involved in farm, energy, and real estate loans, the overwhelming present fact is the threat these loans pose to their survival. In addition to recent records in the number of bank failures, records are being set in the number of troubled banks that require close watching by the regulatory authorities. And difficult though the situation has become for many of the smaller banks in some parts of the United States, the situation of thrift institutions is even more serious. Some states have therefore set aside traditional rules on mergers and branching in order to permit healthy in-state or out-of-state banks to take over troubled commercial

banks or thrift institutions. Regional and local banks that are more lightly involved in domestic problem areas have largely escaped serious difficulties; indeed, some have been taking advantage of regional compacts to merge with out-of-state institutions, thus becoming "superregional" banks that approach in size some of the nation's largest institutions.

By and large, the local community banks still carry on a deposit and loan business of the traditional kind. Few, if any, of them are involved in the new and complex financial services offered by money center banks—although they may occasionally accommodate a customer for such services through a large correspondent bank. But smaller banks also are experiencing the tides of change. Many are introducing small-scale computer technologies to hold down their costs. The composition of their loan portfolios is changing somewhat as a result of securitizing mortgage loans and—more recently—also automobile loans and credit card receivables. Their consumer lending has been increasingly focused on automobile loans and credit cards; their automobile loans, however, have suffered at times from aggressive promotions by captive finance companies of the automobile manufacturers. More generally, since deregulation has led to a large increase in the proportion of their deposits on which they pay market rates, small banks have become more rate conscious. And many formerly isolated banks are beginning to experience competition from banks that are responding to the relaxation of geographic restrictions, as well as from newly empowered thrift institutions and from so-called nonbank banks.

Among the major banks Continental Illinois, which the federal government decided was too large to be allowed to fail, got into difficulties that resulted mainly from its domestic lending. Other money center banks appear to be weathering recent economic and financial storms successfully. They have managed to strengthen substantially their capital positions—a costly adjustment that became essential, particularly in view of their harsh experience with the loans they kept extending to LDCs until the international debt crisis erupted in 1982. Commercial banks are still forced to reschedule payments of principal and frequently even interest on these loans. Not only that, they are also—however reluctantly—now and then lending to the LDCs some additional money in connection with periodic renegotiations of their outstanding loans. At the same time, the money center banks are having to adjust to the drastic shrinkage of their business of lending to large, creditworthy corporations. Syndicated bank credits, which previously dominated the international

credit market, have of late been vastly exceeded in volume by bond offerings.

These major difficulties of the large money center banks are not unrelated. Corporations in need of credit are turning increasingly to the securities markets, primarily because it has become cheaper for them to raise funds that way than to borrow from banks. On the one hand, the cost of borrowing from large banks is higher than it would otherwise have been because of the numerous problem loans to LDCs on the banks' books. Since such loans have increased the exposure of banks to loss, they have led to a reduction in bank credit ratings and to insistence by regulatory agencies that banks raise their capital-to-asset ratios by putting up more capital. Both developments have exerted some upward pressure on bank loan rates. On the other hand, there has been downward pressure on the cost of issuing securities in this country and abroad as a result of continuing deregulation, technological advance, and financial innovation. Where banks have attempted to keep their lending rates competitive with the cost of funds in securities markets, they have often found their profit margins squeezed to the vanishing point.

However, the triad of continuing trends—deregulation, technological advance, and financial innovation—has also been encouraging commercial banks to help participants in securities markets to cope with financial risks. For large banks whose ability to make profitable loans to large corporations was fast disappearing, the fee income received for such services has become important. Fee income has indeed had a special attraction to banks in the 1980s because the underlying transactions, being off-balance-sheet, did not of themselves as yet call for enlarging their capital.

In addition to seeking fee income for financial market services, the large money center banks have been responding to the loss of prime business loans in other ways. One is to sell off loans on their books to smaller banks, domestic branches of foreign banks, pension funds, and other investors –in order to free capital for more profitable undertakings, such as making higher-priced loans to less creditworthy customers, many of whom were formerly serviced by life insurance companies and smaller banks. Another response has been to originate loans with a view to reselling them—a kind of securitization. Still another has been to offer former corporate borrowers new kinds of services, such as worldwide management of their cash flows. Some of the large banks have also been pressing the government regulatory agencies and the Congress for permission to expand into types of underwriting activities and other ventures that at present are

off limits for American banks in this country but not abroad. Their efforts have not been wholly in vain.

Problems Facing Bank Regulators

Momentum of Change in Credit Markets. As a result of a special combination of circumstances in the 1980s, banking and securities markets have been dramatically transformed. Finance today is like a river in flood, washing over and around familiar institutions and pouring across political boundaries, reshaping the landscape as it continually changes its speed and course. Although activities of banking institutions may in some distant future again be tightly harnessed and regulated, they cannot be expected to return to traditional paths.

Increased competition, globalization, and securitization—the three interrelated trends that have been accelerating in the banking world in recent times—are driven by the same mechanism that underlies most economic change: the profits to be gained by meeting market demands at a lower cost or in better ways. These trends have accelerated because a new need—to cope with increased market volatility in interest rates and exchange rates—coincided with rapid technological advances and a growing awareness in regulatory as well as banking circles that much of the regulatory apparatus had become obsolete.

The march of technology cannot be stopped, and the process of financial innovation is bound to continue. As competition intensifies, financial firms will keep innovating to protect their market share and, to the extent possible, to enhance their reputation and profits. Even now, the more enterprising financial firms are institutionalizing the process of innovation by establishing "new product" departments.

And financial innovations will continue to spread rapidly. Techniques that are found useful in certain situations will be applied in their original or some modified form to other situations and in other national markets. Many traditional devices—and some that only recently were new—will be replaced by newer instruments. Thus, the securitization of banking assets began with mortgages and has more recently spread to credit card receivables. Commercial paper was followed by medium-term notes in the American market and by Euro–commercial paper in Europe. Note issuance facilities (NIFs), which recently originated abroad, have more recently been losing ground to Euro–commercial paper programs; the market for perpetual floating-rate notes (FRNs) appears to have dried up; and swaps are evolving in ways that only the most astute financial technicians

can follow. This process of innovation, experimentation, and proliferation of financial market instruments will continue.

There is also little doubt that many banking firms in this country and elsewhere will continue to work assiduously to avoid, weaken, or eliminate regulatory restraints on their activities. These efforts have in recent years forced even reluctant legislators and regulators to drop or relax various regulations. New legislation that may well lead to further deregulation—particularly with regard to underwriting activities of banks—is now being seriously considered by our Congress. In fact, much of the detailed control of financial markets is now generally perceived by governments of the industrial democracies as a costly anachronism. The initiatives toward deregulation taken by the United States, Canada, and Great Britain are having their influence; the laggards among nations find themselves under pressure to catch up.

The Need for Bank Regulation. Deregulation serves a wholesome public purpose to the extent that it nullifies or relaxes regulations that have outlived their usefulness or that serve mainly to protect monopoly interests. But the process of deregulation does not of itself discriminate between good and bad regulations. The consequences for the public welfare require careful and objective examination by everyone concerned with financial markets; for financial flows are the currents that move modern economic activity, and when financial flows threaten to go out of control, our material well-being may be at risk.

Human progress in producing goods and services involves raising the standard of living and improving the quality of life. It reaches people through reductions of costs, widening of choices, improvements in quality, and reductions in risks. Of course, not everyone benefits from each such change; a new technology may destroy the value of a craftsman's skills, and the disappearance of this or that product from retail shelves will trouble some individuals. Nevertheless, the historical record of material production is generally viewed with satisfaction in our times, and most people assume almost without question that the general trend of improvement will continue.

The same applies—up to a point—to financial services. From the viewpoint of an individual, a decrease in the cost of borrowing, an increase in the return from investing, a reduction in risk or in the cost of hedging risk—each is an unmitigated good. From a broad public viewpoint, increases in financial market efficiency are likewise beneficial; they reduce the cost of carrying out transactions, permit better diversification of both portfolios and sources of credit, and—perhaps less obviously—raise living standards by improving the allocation of

existing financial resources. Whether the gain comes from overcoming a barrier imposed by nature or one imposed by government, there will be losers; in particular, some financial firms will experience lower profits or may fail. But as in the case of the displaced craftsman in the nonfinancial world, these failures should not be grounds for stopping progress.

Nevertheless, an increase in the efficiency of financial markets is not necessarily a blessing. The occasional failure of a financial firm is an acceptable price to pay for progress if the firm fails in isolation; the danger, however, is that in a world of close financial interconnections one failing firm may pull down others, and these in turn still others, so that many topple together. This is the international equivalent of a national banking panic. National panics have been generally avoided by industrial countries in recent decades through the construction of financial safety nets. What worries many citizens is that these national safety nets may have been weakened by the recent explosion of financial technology and—worse still—that there is no international safety net.

Risks Attaching to Individual Banks. The regulation of banking has been deemed a public necessity in our country for well over a century. Much the same has been true across the generations in other countries. The fundamental reason for special government attention to banks is that they serve, in effect, as trustees of those who deposit money with them. Although banks no longer have a monopoly on the payments system, they are still its mainstay. The integrity and prudence of bankers, the risks that bankers take with other people's money, inevitably affect the "safety and soundness" of banks. What bankers do may therefore benefit or endanger the prosperity of individual communities or entire nations. Indeed, with the internationalization of banking that has taken place in recent years, the financial stability of virtually the entire world is involved.

Bank regulators seek to ensure confidence in banks by protecting the safety and soundness of the institutions under their jurisdiction. Some individuals may of course feel that this is of little concern to them, since their deposits are insured by the government. Regulators, however, can derive no comfort from this fact, since the protection of the reserves underlying deposit insurance systems is also an integral part of their responsibility. Much of the attention that regulators lavish on individual banks is therefore useful and necessary in maintaining confidence in these institutions. It also serves the larger purpose of protecting the financial system as a whole; for the fewer the number of individual failures, the smaller are the chances that a failure will

precipitate serious difficulties across the national or international economy.

A problem facing bank regulators today—in this country and, no doubt, in others as well—is that they must work with an apparatus that was designed for a financial system very different from the present one. The existing apparatus was originally intended to deal mainly with a national system, in which domestic banks acted in traditional, well-tested, and well-understood ways as intermediaries between resident depositors and borrowers. From the beginning, provisions were made for some minor international activity, and in the 1960s and 1970s these provisions were repeatedly expanded as international banking transactions grew in volume and complexity. Similarly, regulations were modified from time to time to take account of other new developments, including various kinds of efforts by banks or their customers to avoid regulatory constraints. For the most part, however, the modified rules continued to rest on the presumption that the business of banks, including their international business, would be mainly of the traditional form of intermediation between lenders and borrowers. As a result, the existing body of banking law and regulation is poorly adapted to the markedly different kind of domestic and international business—much of it off the balance sheet—that banks are now conducting.

A special concern about the larger banks arises from the growing process of securitization in financial markets. The firms that have moved out of banks and into securities markets are preponderantly those with the highest credit ratings, leaving banks with loans of lower average quality on their books. Moreover, there is a danger that some—perhaps many—banks may be tempted to seek out higher-risk loans in an effort to raise the average yield of their portfolios.

Other problems for regulators arise from the current process of financial innovation. Given the novelty of the transactions in which banks are engaging, their extraordinary diversity, and their frequent changes in form, the larger banks must be finding it extremely difficult to develop a record of experience to guide them along safe lines in current operations. The history of some innovations is as yet much too brief for a firm assessment, and since all of the experience has been accumulated during a period of relative prosperity, its relevance to any future period of economic adversity is uncertain. Indeed, since the enormous complexity of some banking transactions makes them the natural province of financial technicians skilled in higher mathematics, one might wonder how fully the chief executive officers of our major banks appreciate the precise extent to which their banks' solvency is on the line in any month or, for that matter, on any day. What

is obviously required is a well-organized monitoring and control mechanism that takes account not only of the risks involved in particular transactions but also of the correlations among risks of different transactions.

A closely related problem for banks involves determining appropriate prices for their novel services. The price should be high enough to yield some profit after due allowance for costs and for the possibility that transactions may go sour. But in a world that is innocent of historical experience the best information available for pricing may be of limited use. This problem is made particularly acute by the intensity of prevailing competition, which at times induces banks to shade their margins more finely than is suggested by whatever rules they follow.

Regulators are concerned about other aspects of the innovation phenomenon. For example, where new products involve chains of counterparties, banks may be inadequately informed about the creditworthiness of some and therefore of the risks in the arrangement. Customers of a bank, being at times inadequately informed about the risks they are undertaking, may inadvertently expose the bank to the risk of their own defaulting. In the process of reducing risks for their customers, banks may be burdening themselves with undue risks. And there is special reason for concern that they may be making excessive commitments in connection with standby credit lines, guarantees, and other obligations not reflected on their balance sheets; for if a serious setback occurred in securities markets, banks could have difficulty honoring the many calls that would then descend on them.

Moreover, in the new world of banking, regulators share some of the difficulties of bank managers in fully understanding the risks assumed by banks in their ever-changing and highly complex financial arrangements. Regulators face difficulties in getting an overall appreciation of the condition of a banking organization that is simultaneously operating in many markets and many currencies. Nor are commercial bankers and their regulators alone in being concerned that investment banks and other types of financial institutions—which are conducting on a massive scale international transactions indistinguishable from those of international commercial banks—are not subject to banking-type regulation and, as a practical matter, do not have access to Fed assistance.

In short, there is no reason to think that the need for bank regulation—or, to use a softer word, supervision—is any less today than it was in earlier times. But the momentum of change in credit markets has made the task far more difficult. The phenomenon to be controlled has acquired an international character, involving rapidly

changing and novel financial practices. To control this phenomenon we have national governments that are mainly responsive to domestic considerations. In various countries—certainly in the United States—the structure of banking supervision is not very different from what it was a generation ago when banking authorities, being subject to overlapping and tangled legislation, had to struggle to achieve reasonable efficiency in a much simpler financial world.

The difficulties facing bank supervisors are magnified by the fact that distinctions among commercial banks and other financial institutions are becoming increasingly blurred. At present bank supervisors have no authority beyond banking firms, while those supervising securities firms have only the most limited authority beyond securities firms. In the absence of a thorough reform of the supervisory apparatus for the entire financial services industry, it seems clear that bank supervisors and the authorities supervising securities firms will need to work out effective cooperative arrangements for dealing with institutions that are extensively involved in both banking and securities markets. A division of labor between the two along functional lines, while difficult, should not be impossible.

Risk of Systemic Failure. Of all the reasons that bank regulators now have for devoting close attention to banks, by far the most important is the possibility that the failure of a single major bank may precipitate "systemic" failure—a chain reaction in which failing financial institutions bring others down. Historically, the larger banks themselves have acted as a buffer against financial shocks by playing the role of "lender-of-next-to-last-resort" both to necessitous business borrowers and to other banks facing a temporary liquidity problem. More recently, since 1982, they have worked constructively with the International Monetary Fund in staving off an international crisis that could have resulted from the inability of Latin American and other LDCs to meet their debt obligations. But if the securitization process goes much further, as it well may, and banks thus become less important as financial intermediaries, they may no longer be able to extend credit on the scale needed. Beyond that, and as a result of the globalization of banking and the weaving of intricate financial connections among widespread institutions, financial shocks might nowadays be transmitted across markets with alarming speed.

The threat of systemic failure is all the more disturbing because there is no international counterpart to the national safety nets. In the event of a serious threat, the national nets presumably would be deployed. The Federal Reserve, for example, would pump liquidity into the American banking system and open the discount window

wide; in addition, the Federal Deposit Insurance Corporation would attempt to shore up tottering banks or merge them with strong institutions. Similar measures would be taken in other countries. But national safety nets differ in their strength and readiness, and there may be gaps between them. Political problems might pose obstacles—if, for example, American taxpayers were asked to bail out a U.S. subsidiary of a foreign bank at a time when our relations with that foreign country were strained. More worrisome than such possibilities is the fact that national safety nets in the United States, Japan, and perhaps elsewhere do not embrace investment banks. Some of these institutions have become so large that the failure of one of them could have serious international repercussions.

The Need for International Cooperation. Obviously, no nation alone could be counted on to protect the world's banking system—to say nothing of its overall financial condition—from systemic failure. International cooperation is clearly needed to ensure that regulations are adequate to protect the safety and soundness of individual financial firms and that they are sufficiently uniform across countries to prevent firms from flocking to the lowest standard. But cooperation in this sphere, as in many others, presents great difficulties. Each country has its own laws and regulations; each has its own financial structure, tax system, accounting conventions, examination procedures, and statistical reporting systems; each has its own history and is attached to its own traditions. To find common international ground in this uneven terrain is indeed a formidable task.

Still, some highly constructive starts have been made. The need for cooperation in the supervision of international banking first became sharply clear in 1974, in the wake of tremors resulting from the failure of the Franklin National Bank in the United States and the Herstatt Bank in West Germany. Under the auspices of the Bank for International Settlements an international group of banking supervisors, known formally as the Basle Supervisors Committee and informally as the Cooke Committee, began to meet regularly. In 1975 the group produced a "Concordat," which established the fundamental principle that national bank supervisors should cooperate among themselves to ensure that the supervision of international banks was adequate. The Concordat also spelled out a division of responsibilities between "home" and "host" countries with respect to questions concerning the liquidity and the solvency of offices of international banks. A later revision added the principle that supervision should be on a consolidated worldwide basis.

Since then the group has continued to do work of great impor-

tance and has won approval of the Concordat from numerous countries. A recent conference of bank supervisors held in the Netherlands in October 1986 included representatives from virtually every country "with a significant international banking presence"—almost ninety in all. The main discussions at that meeting centered on bank capital and on information flows among bank supervisors in different countries.

More recently—in January 1987—the regulatory agencies of the United States joined with the Bank of England in publishing a proposal for a common "risk-based" capital framework for banks and bank holding companies. Among the listed objectives of the proposal are to make capital requirements more sensitive to differences in the risk of banking institutions; to assess a capital requirement against various off-balance-sheet exposures; to recognize that low-risk, relatively liquid assets require less capital protection; and to move the capital adequacy policies of other major industrial countries into closer alignment with those being proposed for the United States and Great Britain. Once this proposal is adopted by these two countries, others are likely to join. Among other benefits, it would help to strengthen international banks, and it would tend to restrain the temptation to move banking offices or transactions to locations that promise lesser or more lax supervision. Thus progress is being made, although it is not nearly as fast as the new international environment of credit markets requires.

The Vicissitudes of Monetary Policy

In regulating the nation's banking system, the Federal Reserve Board shares responsibility with numerous other federal and state agencies. In attending to international monetary affairs, the Federal Reserve and the Treasury Department work closely together—as a matter of both law and tradition. But in the sphere of domestic monetary policy, the Fed has exclusive jurisdiction, being subject only to various consultative and reporting requirements of the Congress. The Fed is thus one of the very few independent central banks in the world; even its budgetary outlays are determined on its own authority.

However, in conducting monetary policy, the Fed does not operate in a vacuum. The Employment Act, which was adopted by the Congress in 1946, states unequivocally that "it is the continuing policy and responsibility of the Federal government to . . . utilize all its plans, functions and resources . . . to promote maximum employment, production, and purchasing power." The Federal Reserve is

obviously subject to this provision of law. While the precise interpretation of the Employment Act has never been free of controversy, it has been generally agreed that the Federal Reserve's monetary policy is expected to steer a course that promotes the nation's economic growth by helping to avoid both recession and inflation. The Humphrey-Hawkins Act of 1978 was helpful in making this obligation explicit.

Instruments of Monetary Policy. In pursuing the objective of helping to stabilize the economy, the Fed has relied mainly on its ability to control the volume of reserves available to commercial banks through "open-market operations"—that is, through the Fed's purchases and sales of government securities. As noted earlier, the requirement that banks maintain reserves at a certain percentage of their deposits provides the Fed with a lever through which it can induce banks to expand or contract their lending or investing. When the Fed adds to reserves by buying securities, it makes it possible for banks to expand their loans or investments; and when it subtracts from reserves by selling securities, it puts pressure on banks to contract their loans or investments.

In addition to open-market operations, the Fed has a variety of tools at its disposal. It can change the percentage of deposits that banks are required to keep in reserve. It can raise or lower the discount rate—that is, the interest rate at which it is prepared to lend to banks that may be short of reserves. At times, as in the late 1960s, the Fed has employed moral suasion. At other times, as in the early 1960s and again in 1980, it has imposed selective controls on particular forms of credit under legislative authority that has since expired. But the one tool that the Fed has relied on most consistently and most heavily is open-market operations.

Accordingly, we can picture the Fed as engaged over the years in buying and selling government securities for the proximate purpose of influencing bank reserves and for the ultimate purpose of enabling overall spending—and therefore production and employment—to follow a path that may avoid both inflation and recession. A useful, if obvious, analogy is the task confronting a ship's pilot. To achieve success, he must be skilled in navigating in all kinds of weather; he must be constantly alert to the possibility of a squall or the nearby presence of other ships; and he must be well informed about both the proper channel and the ways in which his ship responds to adjustments to the wheel. Similar requirements apply to the Fed in its efforts to help steer the economy along a safe course. But the Fed's task is more difficult.

However skilled and alert the Fed might be, its knowledge about the channel through which it must steer is very limited; in view of the uncertainties of economic forecasting, the Fed is forever traversing uncharted waters. Moreover, it cannot be sure how the economy will respond when it adjusts its policies, since the structure of financial markets and the behavior of market participants are continually changing. The Fed is always learning from experience how things have worked; but it is never sure how they are working now, much less how they will work in the future.

Changing Paths of Monetary Policy. The emergence of new financial practices in the 1960s and 1970s—including liability management by commercial banks, cash management by corporate treasurers, resort to new financial instruments, and shifts by corporate borrowers from banks to securities markets—led to substantial changes in the way open-market operations influenced the economy. In the simple world of the 1950s, when businesses relied on commercial banks for credit and the banks relied on the Fed for lending resources, the Fed had relatively close control over the volume of credit extended across the economy. Allocation of the available bank credit among potential borrowers was largely a matter of banking judgment; interest rates, to be sure, played a role—but a relatively small role—in the process. Later, however, business firms learned how to bypass banks in getting credit; banks learned how to bypass the Fed in acquiring funds for lending; everyone became more concerned about interest rates; and capital flowed more freely toward the highest returns.

In this new world of increased capital mobility, monetary policy influenced the economy mainly through the channel of interest rates. "Tight money" now meant high interest rates rather than credit stringency, and "easy money" meant low interest rates rather than readily available credit. In periods of tight money the most interest-sensitive sectors of the economy—residential construction, business outlays on plant and equipment, and inventory investment—bore the main burden of retrenchment; and when easy money returned, these sectors generally revived.

High interest rates are, of course, politically unpopular, and the fact that monetary policy had begun to work to a much greater degree through interest rates evoked criticism in congressional quarters and complicated the Fed's struggle against inflation during the 1970s. The Fed's problem was compounded as the rate of inflation intensified, for the level of nominal interest rates had then to be progressively higher in order to achieve any given degree of restraint on spending in the economy. Moreover, once floating-rate loans came into wide use, a

rise in interest rates was less likely to discourage borrowers, since they were not necessarily locked into the higher rate for the full term of their loans.

The developments of the 1960s and 1970s also created a problem in connection with short-run targets for monetary policy. In the absence of a stable—and known—relationship between open-market operations and overall domestic economic activity, the Fed defined its short-run objectives for open-market operations in terms of an "intermediate" variable. The variable of choice was a measure which the Fed believed it could control with reasonable precision and which at the same time appeared to be related with a reasonable degree of closeness to its ultimate objective for domestic economic activity. Through the 1960s the Fed had relied mainly on interest rates for this purpose; that is, it sought higher open-market rates when circumstances seemed to call for monetary restraint and lower rates when monetary ease was deemed appropriate. But as inflation and inflationary expectations flared up in the 1970s, interest rates lost value as a guide to the degree of monetary tightness.

Once expectations of inflation become widespread in a country, lenders expect to be paid back in cheaper currency and are therefore apt to demand higher interest rates. Since borrowers have similar expectations, they are willing to comply. An "inflation premium" thus gets built into market interest rates. The size of the premium depends on the magnitude of the inflation expected by lenders and borrowers. These expectations are bound to differ among individuals, and they also vary over time. Thus, when faced with substantial but fluctuating inflationary expectations, central bankers can never be sure how much of a change in market interest rates reflects a change in the inflation premium as opposed to a change in the "real" rate—that is, the market rate less the inflation premium.

With the spread of inflationary expectations in the 1970s, a significant change occurred in the way the economy responded to monetary policy. In the earlier era of little inflation, a move by the Fed toward monetary stimulation—say, a step-up in open-market purchases of government securities—could reasonably be expected to lead to lower interest rates, which in turn would induce increased spending on goods and services and therefore higher output and employment. In the inflationary era, however, stimulative policy measures tended to augment inflationary expectations and inflation premiums and thus often led to increases rather than decreases in market interest rates—particularly on long-term obligations. Moreover, any rise in spending that resulted from the stimulative action was likely to translate into higher prices rather than higher levels of output and employment. In

short, in the inflationary environment of the late 1970s, monetary policy had virtually lost its ability to call forth higher levels of output and employment through stimulative actions. It retained, however, the power to counter inflationary pressures through restrictive actions, as the Fed and other central banks demonstrated with great force in the early 1980s.

During the 1970s the Fed, along with other central banks, began to devote more and more attention to the rate of growth of the money supply. The use of the money supply as an intermediate variable was supported by the beliefs—long pressed by monetarists and increasingly accepted by others—that targeting interest rates was a flawed procedure which had contributed to the buildup of inflationary pressures, and that the control of inflation over the medium and longer run required appropriate restraint on the growth rate of money. The Fed's use of money for target purposes was formalized in 1975 by a congressional resolution asking the Fed to report regularly on its objectives for growth in "the monetary and credit aggregates." In 1978 a similar requirement was embodied into law.

In response to these congressional pressures, the Fed began to report its objectives for the growth of several plausible measures of the money supply. From the beginning, attention was focused mainly on "M-1"—the traditional measure of money, consisting of currency in circulation plus demand deposits; however, the broader monetary aggregates—"M-2" and "M-3"—were not ignored. But soon came the proliferation of alternatives to demand deposits for holding liquid balances—deposits at thrift institutions as well as banks in NOW accounts, money market certificates, small savers certificates, and the like, and shares in money market mutual funds. The emergence and rapid growth of these close domestic substitutes for traditional money required changes in the definitions of the various monetary aggregates and raised difficult questions about choosing the best definition for monetary policy purposes. More important, the proliferation of close substitutes for traditional money greatly weakened the quantitative relationship between money, however defined, and spending on domestic goods and services and thus undercut the usefulness of data on the money supply as an intermediate variable. These problems were compounded by vast increases in the volume of dollar-denominated bank accounts held outside the United States and by the growing substitutability between dollars and key foreign currencies.

By the early 1980s, it appeared that monetary policy had lost its moorings in both interest rates and monetary aggregates. The emphasis on tighter control of the monetary aggregates, particularly of M-1, that had been inaugurated in the fall of 1979 was thus dropped three

years later; and having to navigate since then without much useful guidance from an intermediate variable, the Fed has of necessity taken an eclectic approach to monetary policy.

Consequences of the Globalization of Trade and Finance. The developments of the 1970s and 1980s in international trade and finance have further complicated the problems of monetary policy. The international complications can be sorted into three broad groups: those that arise from the fact that our trade with other nations has been growing; those that result from the shift in the early 1970s from fixed to flexible exchange rates; and those that relate to the extraordinary increase in the international mobility of capital in recent years.

In a world of extensive international trade, there are bound to be geographic spillover effects of a nation's monetary policy actions. Some of the American spending induced by a stimulative monetary policy will be on foreign goods and services, while some of the spending by a foreign country that is brought on by a stimulative action of its monetary authority will be on American goods and services. No central bank can confine the consequences of its actions to its home territory, and none can escape the influence of foreign developments.

The importance of these effects for any particular nation depends on the magnitude of its foreign trade. Small nations, for which most trade is likely to be foreign trade, have relatively little control over the course of their economies. For the United States, foreign trade—although large in absolute amount—has historically been small in relation to the size of our economy. Beginning in the 1970s, however, both our imports and our exports have been growing in relation to total output. In formulating monetary policy the Fed must therefore take into account both the effects of its policies on other nations and the consequences for the United States of the policies being pursued in foreign lands.

The shift from fixed to floating exchange rates in the early 1970s added a new channel through which monetary policy affects spending on domestic output, and in the process it has produced a significant change in the sectoral impact of monetary policy. Under fixed exchange rates, monetary restraint worked primarily by raising the level of domestic interest rates, and its main effects were on such interest-sensitive activities as residential construction and business fixed investment. To the extent that capital was mobile internationally, high interest rates in the United States would have tended to attract investment funds from other countries. But such flows would have put downward pressure on the exchange rates of foreign currencies

against the dollar, and central banks committed to maintaining fixed exchange rates would therefore have had to take offsetting actions—such as raising their own interest rates—to discourage the outflows.

In the present regime of flexible exchange rates, however, foreign central banks are not obliged to take such actions; and funds from their countries may therefore flow freely to the United States or elsewhere in pursuit of higher returns. In fact, foreign funds have been flowing into the United States on a massive scale in recent years, as a consequence in large part of the relatively high interest rates produced by our mix of fiscal and monetary policies. Inflows of that kind have two simultaneous effects. First, by adding to the supply of funds in our financial markets, they exert a moderating influence on interest rates. Second, by increasing the demand for dollars in the foreign exchange markets, they put upward pressure on the dollar exchange rate. The first effect—the moderating influence on interest rates—means that the interest-sensitive sectors of our economy are no longer punished by tight money as severely as they formerly were. But the second effect—the rise in dollar exchange rates against foreign currencies—results in a fall in our exports and a rise in our imports; that is, it results in a shift from spending on domestic output to spending on foreign output. This means that the burden of tight money is nowadays borne in good part by sectors of our economy that previously did not suffer unduly, namely, those that export a substantial part of their output and those that compete with imports.

The addition of this important new channel for the transmission of the effects of monetary policy has modified the relation between the Fed's policy actions and the resulting change in spending on domestic output; in particular, lags have become longer, and the magnitude of the response less certain. This new development has also posed a political problem for the Fed. The newly affected groups include farmers and manufacturers, among others. Compared with the long-suffering home builders, these groups are less likely to identify the Fed and its anti-inflation policy as the immediate source of their problems; rather, they will see the enemy in their foreign competitors and call for import protection or export subsidies. Even if they appreciate the Fed's role, they are still likely to demand that their difficulties be remedied by intervention in the nation's foreign trade, and experience demonstrates that they are likely to find sympathetic ears in Congress and the executive branch. The possibility of such an outcome is bound to make it more difficult for the Fed to pursue anti-inflation efforts. And if the Fed should barge ahead—and perhaps precipitate massive protectionism—it might wind up with a more timid policy anyway. For with farmers and manufacturers "protected"

against foreign competition, any given degree of restraint on overall spending could then be attained only by squeezing home builders and others still more, and that would probably involve pressing interest rates to unacceptably high levels.

The heightened international mobility of capital has created its own special problems for monetary policy. It is now simple and inexpensive for investors and borrowers almost anywhere in the world to shift their transactions from one currency to another or from one national market to another. Huge sums can be set in rapid motion by relatively small changes in interest rates or exchange rates or even by news reports or rumors bearing on the outlook for rates or government policies. This rapid mobility of capital can prove troublesome for the United States, in view of our current need for capital inflows to help finance our huge public and private borrowing.

More generally, however, the speed with which international financial markets can react to events can have serious consequences for the Fed's ability to act in accordance with its judgment about the needs of the domestic economy. Consider, for example, the different speeds of response of exchange rates and flows of foreign trade. Since exchange rates can respond rapidly to a monetary action while the effects of that change on trade might extend over several years, it is difficult for the Fed to determine the appropriate scale of its policy measures. Moreover, since exchange rates may easily overshoot their ultimate level, reluctance by the Fed to contribute to exchange rate volatility may incline it to temper its actions from the optimum indicated by its economic analysis.

Altogether, as the world's markets for goods and financial services become increasingly integrated, it is becoming harder for central banks of industrial countries to maintain national financial conditions that differ significantly from conditions in the industrial world at large. We appear to have reached a stage in the world's economic evolution where central bankers and finance ministers of the major countries will be able to achieve the financial conditions they desire in their own countries only by acting in concert with their counterparts in other major countries.

The Need for Coordinating Economic Policies. The loss of national autonomy in the sphere of economic policy has been reflected recently in the repeated appeals by American officials to Germany and Japan to adopt more stimulative policies; in the repeated appeals by officials of Germany, Japan, and other countries to the United States to reduce its federal budget deficit; and in the consultations among finance ministers and central bank governors of the leading industrial

democracies about the course of their domestic policies and movements in the exchange rates among their currencies. Such consultations led to the "Plaza" agreement of September 1985 on measures to achieve better relations among exchange rates and to coordinated actions on discount rates in the early months of 1986.

At their latest meeting, held in Paris in early 1987, the ministers and governors agreed to cooperate closely to foster stability of exchange rates around current levels, which, in their judgment, were "within ranges broadly consistent with underlying economic fundamentals." Much to their credit, they also recognized that the major industrial countries "have a special responsibility to follow policies which foster an open, growing world economy in order to support the efforts of developing countries, especially debtor countries, to restore steady growth and viable balance of payments positions."

The need for cooperation among nations with respect to economic problems is not a recent discovery. Even before World War II came to an end, agreement was reached at Bretton Woods on a new international monetary system, in which a key role would be played—as it indeed has been—by a new institution, the International Monetary Fund. Agreement was also reached at Bretton Woods on a sister institution, the International Bank for Reconstruction and Development, commonly called the World Bank, which has played a significant role in financing economic development in the third world. Shortly after the war a conference in Geneva led to the General Agreement on Tariffs and Trade, which has served as a powerful force for trade liberalization in the postwar era. The European Community, established in Rome in 1957, includes nations that have substantially reduced barriers to the movement of goods, services, and labor among themselves and that are cooperating across a wide range of policies. Most members of the community joined together in 1979 to form the European Monetary System, under which their currencies are pegged to one another. And for a good many years, the central bank governors of the "Group of Ten" —comprising the ten leading industrial countries—have discussed problems of common interest and occasionally have taken common action at their monthly meetings, held under the auspices of the Bank for International Settlements at Basel.

Clearly, there has been no lack of international consultation, coordination, and cooperation with respect to various kinds of economic policy, and the results of these efforts have often proved beneficial. And yet there are grounds for disappointment in what has been achieved, especially in recent years, in coordinating national monetary and fiscal policies for the purpose of improving world economic

conditions. Too often well-publicized international meetings have accomplished little of lasting value. Too often coordinated action has been agreed to only grudgingly, late, and in insufficient measure.

The reasons for these shortcomings are not far to seek. There are differences among nations in prevailing economic conditions and therefore in the perceived need for change; there are differences in national priorities; and there are honest disagreements about the causes of existing problems and the best means of resolving them. But perhaps the most fundamental difficulty is a political one. Since governments of democratic nations respect the voices of their citizens, the range of actions on which they can agree with other nations is constrained by considerations of domestic acceptability. To understand the depth of this difficulty, one need only consider how hard it is within our own nation to bring the various elements of fiscal policy together into a rational whole in the face of competing pressures from interest groups and wide differences between the Congress and the White House.

In sum, there are enormous problems in developing effective international cooperation in the area of monetary and fiscal policy, just as there are in the area of supervision of financial institutions. Although the sources of the problems are quite different—being mainly political in the former case and mainly technical in the latter—the need for resolving them is pressing and will become more pressing with the passage of time. Since the world's problems in these areas are far beyond the reach of national tools for their resolution, nations must find the will and the means to cooperate in their mutual interest. Fortunately, this need is increasingly understood by leading citizens around the world. We can only hope that their views will prevail and that people generally will come to understand that our international political arrangements are as yet poorly adapted to the sweeping internationalization that has been under way in recent years in technology, industrial activities, trade, banking, and securities markets.

Appendix

TABLE A–1

KEY PROVISIONS OF MAJOR U.S. BANKING LAWS

National Bank Act of 1863

- established Office of Comptroller of Currency (OCC) in Treasury Department to administer laws relating to national banks
- provided for chartering, supervision, and examination of national banks by OCC and for submission of periodic condition reports to OCC
- specified minimum capital requirements for national banks
- specified reserve requirements against notes and deposits; in addition to vault cash, "country banks" could hold reserves at reserve city or central reserve city banks, and reserve city banks could hold reserves at central reserve city banks
- prohibited loans to any one borrower exceeding 10 percent of capital stock
- authorized branches of national banks only for previously owned branches of state banks converting to national banks

Federal Reserve Act (1913)

- established Federal Reserve Board (FRB) in Washington and twelve district Federal Reserve Banks (FRBks) to oversee Federal Reserve System (FRS); board consisted of seven members, including secretary of Treasury and comptroller of currency
- required all national banks to become members of FRS and permitted eligible state banks to join
- specified minimum capital requirements for member banks
- specified reserve requirements for member banks; reserves had to be held in FRBk in member bank's district
- authorized national banks to establish branches abroad
- granted trust powers to national banks
- authorized FRBks to discount notes, drafts, and bills of exchange arising out of commercial transactions and acceptances arising out of imports and exports
- authorized FRBks to set discount rates subject to review and determination by FRB

(Table continues)

TABLE A–1 (continued)

- authorized FRBks to buy and sell U.S. government securities
- authorized FRBks to issue Federal Reserve notes to serve as legal tender
- required OCC to examine member banks at least twice each year
- authorized FRB to examine each FRBk and each member bank at its discretion and to require such statements and reports as it deemed necessary
- directed FRBks to act as fiscal agents for U.S. Treasury

Edge Act (1919)

- authorized FRB to charter corporations to engage in international banking and permitted domestic banks to invest in such corporations; Edge Act corporations may not engage in banking activities in United States or invest in corporations that do business in United States unless FRB concludes such activities are incidental to corporation's foreign activities

McFadden Act (1927)

- permitted national banks (with approval of OCC) and state member banks (with approval of FRB) to branch in their home cities to the extent that state banks were similarly permitted by state law; as a result, national banks were not permitted to branch across state lines

Banking Act of 1933

- created Federal Open Market Committee (FOMC) to regulate and coordinate transactions in U.S. government securities by FRBks
- prohibited payment of interest on demand deposits
- gave FRB authority to impose interest rate ceilings on time and savings deposits at member banks
- created Federal Deposit Insurance Corporation (FDIC) and provided for deposit insurance up to limit of $2,500 for each deposit (insurance limit was raised to $5,000 in 1934)
- prohibited loans by member banks to executive officers
- authorized national bank examiners to examine affiliates of banks
- sections 16, 20, 21, and 32 (collectively known as Glass-Steagall Act) provided for separation between banking and securities business:

sec. 16—prohibited national banks and state member banks from purchasing equities and prohibited their underwriting and dealing in securities other than U.S. Treasury securities, agency obligations, and general state and municipal obligations

sec. 20—prohibited member banks from affiliating with organizations engaged principally in securities activities

sec. 21—prohibited a person engaged in securities business from receiving deposits (with certain exceptions for state-chartered banks)

sec. 32—prohibited interlocking directorates between member banks and securities firms unless authorized by FRB

Banking Act of 1935

- restructured FRB to consist of seven members, not including secretary of Treasury and comptroller of currency

TABLE A–1 (continued)

• restructured FOMC to consist of members of FRB plus rotating group of five FRBk presidents

• revised FDIC and expanded its regulatory authority over insured banks

• gave FRB authority to adjust reserve requirements within specified ranges

• permitted national banks to make five-year real estate loans

• authorized ceilings on interest rates on time and savings deposits at all federally insured banks

FDIC Act (1950)

• put FDIC under separate law and gave it extensive authority over insured banks and branches in the United States

• provided for assessments against insured institutions and for creation of a permanent insurance fund

• authorized FDIC to borrow from Treasury

• raised limit on insured deposits from $5,000 to $10,000

Bank Holding Company Act of 1956

• gave to FRB the primary responsibility for supervising and regulating multibank holding companies, in order to avoid restraint of trade in banking and to maintain a separation between commerce and banking by permitting holding companies to engage only in nonbanking activities that are closely related to banking

• provided that a bank holding company operating in one state may not acquire a bank in a second state unless that state expressly authorizes the acquisition by statute

• grandfathered existing interstate bank holding companies and allowed bank holding companies to place certain nonbank affiliates in other states

Bank Merger Acts of 1960 and 1966

• prohibited mergers between an insured bank and a noninsured institution without approval of FDIC

• prohibited mergers of any two insured banks without approval of (1) the OCC if resulting bank is to be a national bank, (2) the FRB if resulting bank is to be a state member bank, or (3) the FDIC if resulting bank is to be a nonmember insured bank

• specified that mergers were not to be approved if they would create a monopoly or if they would substantially lessen competition unless anticompetitive effects were clearly outweighed by convenience and needs of community

• authorized Justice Department to bring suit under antitrust laws to prevent a proposed merger

1966 Amendment to Bank Holding Company Act

• made the factors FRB is to consider in acting on bank holding company applications conform to those designated in the 1966 Bank Merger Act

(Table continues)

TABLE A–1 (continued)

• defined a bank as an institution accepting demand deposits

Interest Rate Adjustment Act (1966)

• extended deposit rate ceilings to all federally insured time and savings deposits, including those at savings and loan associations and mutual savings banks

Financial Institutions Supervisory Act of 1966

• granted extensive cease-and-desist and other enforcement authority to the OCC, FDIC, and FRB in the interest of protecting the safety and soundness of financial institutions

• increased the limit on insured deposits from $10,000 to $15,000

1970 Amendments to Bank Holding Company Act

• extended FRB's authority over bank holding companies to one-bank holding companies

• broadened somewhat the exceptions to the prohibition against bank holding companies engaging in nonbanking activities

• defined a bank as an institution accepting demand deposits and making commercial loans

International Banking Act of 1978

• placed foreign banks on a more equal footing with domestic banks by authorizing foreign banks to open federally chartered branches and agencies in the United States; by extending to U.S. branches of foreign banks provisions of laws affecting U.S. banks with respect to examinations, Regulation Q, reserve requirements, deposit insurance, bank holding company restraints, and others; and by providing access to Federal Reserve facilities for foreign banks that maintain reserves at FRBks

• grandfathered interstate branching and investment banking activities that were in operation before specified dates

Full Employment and Balanced Growth (Humphrey-Hawkins) Act of 1978

• established medium-term goals for reduction of unemployment and inflation

• required FRB to transmit to Congress twice a year analyses of recent economic developments, statements of objectives and plans of FRB with respect to ranges of growth of monetary and credit aggregates for the calendar year, and statement of the relations of such objectives to short-term goals of the president and any approved by the Congress

Federal Financial Institutions Examination Council Act of 1978

• created council consisting of heads of OCC, FRB, FDIC, Federal Home Loan Bank Board, and National Credit Union Administration to prescribe uniform principles for federal examination of financial institutions and to make recommendations to promote uniformity in their supervision

TABLE A–1 (concluded)

Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980

- provided for six-year phase-out of Reg. Q ceilings on time and savings deposit interest rates
- authorized NOW accounts for all federally insured depository institutions
- eliminated FRB reserve requirements on personal time and savings deposits
- simplified reserve requirements on transactions accounts and applied these requirements to nonmember banks and thrift institutions as well as to member banks
- required FRBks to provide nonmember banks and thrift institutions such services as borrowing at discount window, check clearing, safekeeping of securities, wire transfers, automatic clearinghouse facilities, and cash transportation services
- required FRBks to provide services at prices reflecting costs plus markups
- authorized savings and loan associations to invest up to 20 percent of assets in consumer loans, commercial paper, and corporate debt securities; to issue credit cards; and to exercise trust powers
- authorized mutual savings banks to make commercial, corporate, and business loans up to 5 percent of assets
- relaxed state usury ceilings
- raised ceiling on deposit insurance from $40,000 to $100,000 (ceiling had been raised from $15,000 to $20,000 in 1969 and to $40,000 in 1974)

Garn–St Germain Depository Institutions Act of 1982

- authorized depository institutions to offer money market deposit accounts, with no interest ceiling and insured up to $100,000
- authorized thrift institutions to invest in state government securities; to make commercial and agricultural loans up to 10 percent of assets; and to accept deposits from businesses with which a loan relationship had been established
- increased lending limits for national banks
- authorized various actions by regulatory agencies to assist troubled institutions, including approval of emergency acquisitions across state lines

International Lending Supervision Act (1983)

- authorized regulatory agencies to establish minimum capital levels for banks and to require special reserves on loans adversely affected by country risk

TABLE A–2: ECONOMIC ACTIVITY, INTERNATIONAL TRADE, AND INTERNATIONAL BANKING, SELECTED YEARS, 1964–1985
(billions of dollars at current prices and current exchange rates)

Indicator	*1964*	*1972*	*1980*	*1983*	*1985*	*Compound Annual Rate of Growth, 1964–85*
Gross domestic product, world excluding Soviet bloc[a]	1,605	3,336	10,172	10,140	12,825 E	10.4
International trade in goods and services, world excluding Soviet bloc[a]	188	463	2,150	1,986	2,190 E	12.4
International banking						
BIS series for net international bank credit, BIS reporting area[b]	12 E	122 E	810	1,240	1,485	25.8
Morgan Guaranty series for gross size of international banking market[c]	20 E	208 E	1,559	2,253	2,598	26.1

NOTE: BIS is Bank for International Settlements. E—partly estimated by Ralph C. Bryant, Senior Fellow, Brookings Institution.

a. Both the output and the trade series incorporate rough estimates for some countries. "Trade" is a country aggregation of statistics for exports of goods and services.

b. In concept this series nets out interbank redepositing among the banks in the reporting area. The reporting area in recent years has included banks in the Group of Ten countries plus Luxembourg, Austria, Denmark, Ireland, and the offshore branches of U.S. banks in the Bahamas, the Cayman Islands, Panama, Hong Kong, and Singapore. Banks in Finland, Norway, and Spain were added to the reporting area as of December 1983. Only the Group of Ten countries were included in the reporting area in the 1960s and early 1970s.

c. This measure differs from the BIS series for net international bank credit in two major ways: it includes redepositing among the reporting banks, and it defines the reporting area to cover a larger number of countries and banks.

SOURCES: Ralph C. Bryant, *International Financial Intermediation* (Washington, D.C.: Brookings Institution, 1987), table 3–1. Based on data from the International Monetary Fund, *International Financial Statistics*, Supplement on Output Statistics No. 8 (Washington, D.C.: IMF, 1984); International Monetary Fund, *International Financial Statistics Yearbook 1986;* Bank for International Settlements, annual reports and quarterly statistical releases on international banking developments; and Morgan Guaranty Trust Company of New York, *World Financial Markets*, various issues.

FIGURE A–1

U.S. Bill Rate, Exchange Rate, and Rate of Change of Prices, 1955–1987

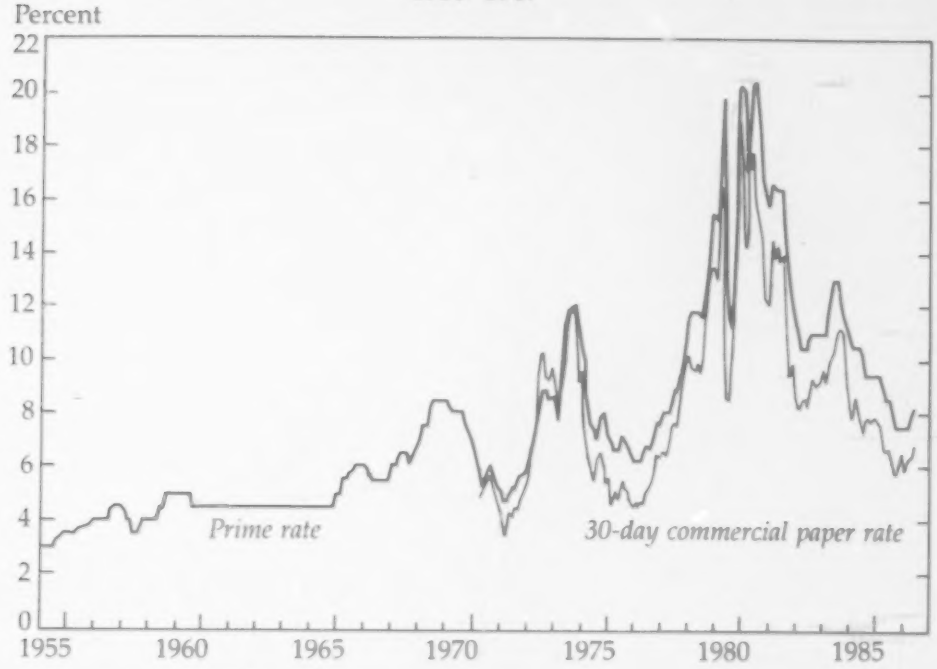
Note: *Exchange value of U.S. dollar.* Index of weighted-average exchange value of U.S. dollar against the currencies of ten industrial countries. The weight for each of the ten countries is the 1972–1976 average world trade of that country divided by the average world trade of all ten countries combined. Source: *Federal Reserve Bulletin*, various issues.

Treasury bill rate. Secondary market rate on ninety-day Treasury bills, quoted on a bank-discount basis. Source: Data Resources, Inc.

Consumer price index. Change from same month of preceding year in consumer price index for all urban consumers. Based on data compiled by Bureau of Labor Statistics.

FIGURE A–2

BANK PRIME RATE VERSUS INTEREST RATE ON COMMERCIAL PAPER, 1955–1987

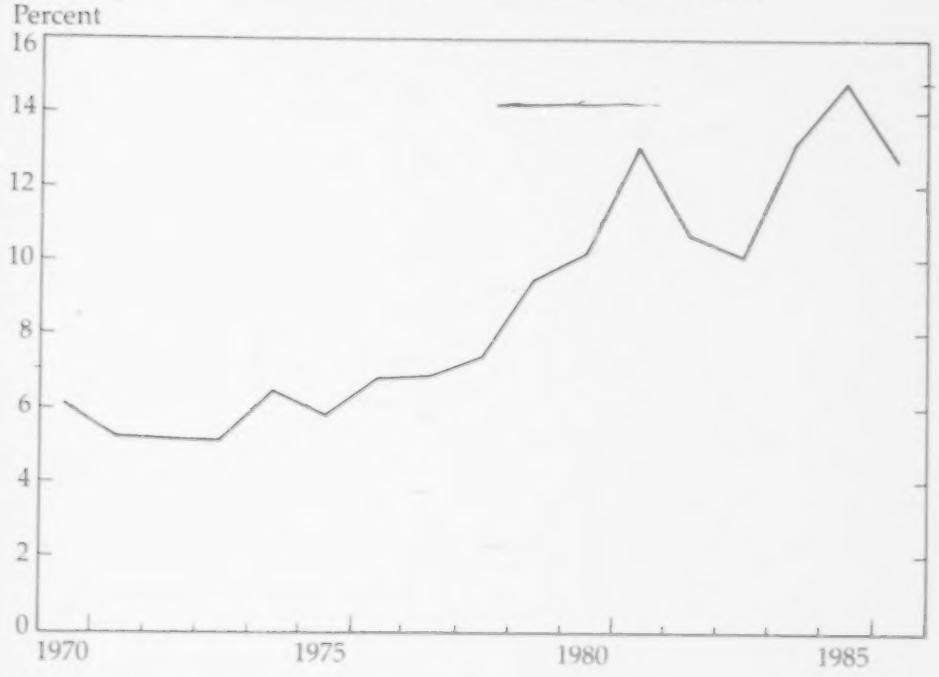


NOTE: *Prime rate*. Prime rate charged by banks on short-term business loans. Source: Data Resources, Inc.

Thirty-day commercial paper rate. Secondary market rate on one-month commercial paper placed through dealers and issued by companies whose bond rating is Standard & Poor's Aa or the equivalent. Rate is offering rate quoted by brokers and dealers, expressed on a bank-discount basis. Source: Federal Reserve Bank of New York.

FIGURE A–3

RELATIVE IMPORTANCE OF COMMERCIAL PAPER IN SHORT-TERM BUSINESS CREDIT, 1970–1986

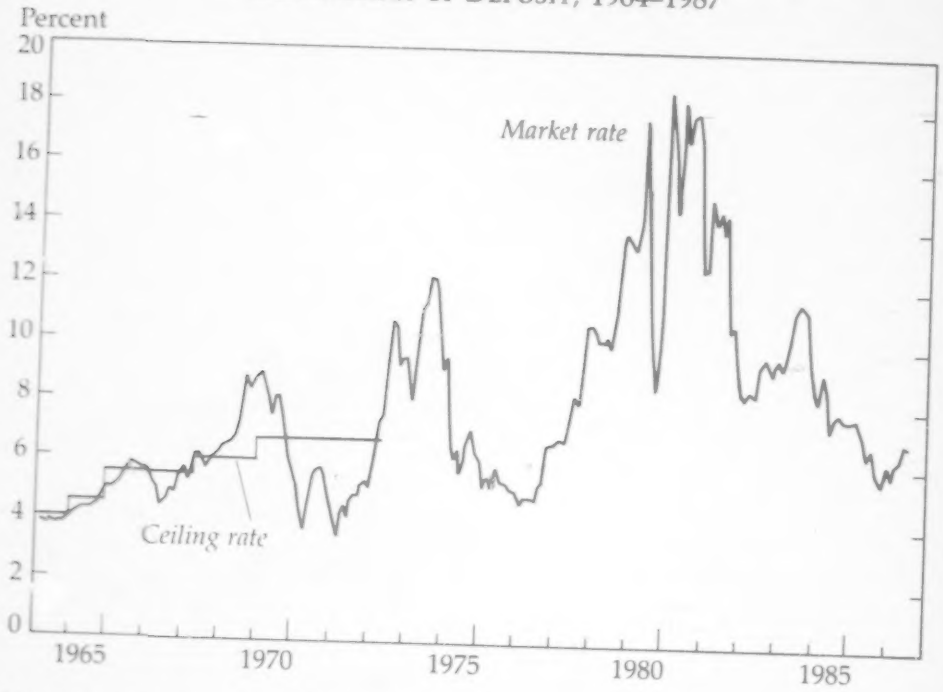


NOTE: Volume of commercial paper issued by nonfinancial companies, as a percentage of sum of commercial paper issued and short-term commercial and industrial bank loans at all commercial banks.

SOURCE: Based on data from *Federal Reserve Bulletin*, various issues.

FIGURE A–4

Market and Ceiling Rates on Large-Denomination Certificates of Deposit, 1964–1987



NOTE: *Market rate.* Secondary market rate on large-denomination ninety-day certificates of deposit. Averages of daily figures.
Ceiling rate. Maximum rate on ninety-day single-maturity time deposits in denominations of $100,000 or more. (Before July 20, 1966, maximum applied to smaller ninety-day CDs as well.) Maximums on CDs with maturities of ninety days or more were suspended in May 1973.
SOURCES: Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics, 1941–1970,* table 12.4A; *Statistical Digest,* 1973–1977, table 8; *Federal Reserve Bulletin,* various issues; and statistical release G.13.

TABLE A–3

SELECTED MEASURES DEREGULATING DEPOSIT-TAKING ACTIVITIES, 1970–1986

Effective Date	*Measure*
June 1970	Reg. Q ceilings suspended on large-denomination negotiable certificates of deposit (CDs) with maturities of 30–89 days
September 1970	Federally chartered savings and loan associations (S&Ls) permitted to make preauthorized transfers from savings accounts for household-related expenditures
June 1972	State-chartered mutual savings banks (MSBs) in Massachusetts began offering negotiable-order-of-withdrawal (NOW) accounts
May 1973	Reg. Q ceilings suspended on large-denomination negotiable CDs with maturities of 90 days or more
January 1974	All depository institutions in Massachusetts and New Hampshire authorized by Congress to offer NOW accounts
November 1974	Commercial banks permitted to offer savings accounts to state and local government units
April 1975	Member banks authorized by Federal Reserve to make transfers from a savings account to a demand deposit on customer's telephone order
November 1975	Commercial banks permitted to offer savings accounts to businesses
February 1976	All depository institutions in New England authorized by Congress to offer NOW accounts
May 1976	State-chartered S&Ls and MSBs in New York authorized to offer checking accounts
June 1978	All insured banks and thrifts authorized to offer 6-month money market certificates (MMCs) with minimum denomination of $10,000 and ceiling rates related to that on 6-month Treasury bills
October 1978	Depository institutions in New York authorized by Congress to offer NOW accounts
November 1978	Commercial banks and MSBs authorized to offer automatic transfer service (ATS) from a savings account to a checking account
July 1979	Commercial banks and thrifts authorized to offer small saver certificates with no minimum denomination but

(Table continues)

TABLE A–3 (continued)

Effective Date	*Measure*
	with minimum maturity of 4 years and ceiling rates somewhat below that on 4-year Treasury securities
January 1980	Minimum maturity of small saver certificates reduced to 2½ years, with ceiling rates somewhat below that on 2½-year Treasury securities
December 1980	Commercial banks and thrifts nationwide authorized to offer NOW accounts; maximum rate payable set at 5¼ percent; no minimum denomination
December 1981	Commercial banks and thrifts authorized to offer ceiling-free individual retirement accounts (IRAs) and Keogh accounts with maturities of 1½ years or more and fixed or floating rates; no minimum denomination
May 1982	Commercial banks and thrifts authorized to offer ceiling-free accounts with minimum maturity of 3½ years and no minimum denomination
	Commercial banks and thrifts authorized to offer 91-day time deposits with ceiling rate related to rate on 3-month Treasury bills and minimum denomination of $7,500
September 1982	Commercial banks and thrifts authorized to offer 7- to 31-day accounts with ceiling rate related to rate on 3-month Treasury bills and minimum denomination of $20,000
December 1982	Commercial banks and thrifts authorized to offer money market deposit accounts (MMDAs)—ceiling-free accounts with no minimum maturity but with $2,500 minimum balance and limited transaction features
January 1983	Commercial banks and thrifts authorized to offer Super NOW accounts—ceiling-free transactions accounts with $2,500 minimum balance
	Minimum denomination on 7- to 31-day accounts, 91-day time deposits, and 6-month MMCs reduced to $2,500
	Rate ceiling removed for 7- to 31-day accounts
April 1983	Rate ceilings removed for time deposits at commercial banks and thrifts with maturities of 2½ years or more
October 1983	Rate ceilings removed for time deposits at commercial banks and thrifts with maturities of more than 31 days and for shorter-term deposits with minimum balance of $2,500

TABLE A–3 (concluded)

Effective Date	*Measure*
January 1985	Minimum balances for MMDAs, Super NOWs, and 7- to 31-day accounts reduced to $1,000
January 1986	All minimum balance requirements removed
	Rate ceilings and other regulatory limitations on NOW accounts removed
April 1986	Rate ceiling on passbook savings accounts removed
	Authority of federal regulators to set deposit rate ceilings expired

SOURCES: *Annual Report of Council of Economic Advisers,* January 1981, table 11; and Patrick I. Mahoney et al., "Responses to Deregulation: Retail Deposit Pricing from 1983 through 1985," table A-6, Federal Reserve Board, January 1987.

TABLE A–4

VOLUME OF LOANS SECURITIZED, 1971–1987

(millions of dollars)

	Residential Mortgage Pass-through Securities		*Securities Backed by Automobile Receivables*	*Securities Backed by Credit Card Receivables*	*Lease Financing Securities*
	Federally related[a]	Private issues[b]			
1971	2,767	0	0	0	0
1972	3,156	0	0	0	0
1973	3,276	0	0	0	0
1974	4,597	0	0	0	0
1975	8,397	0	0	0	0
1976	15,126	27	0	0	0
1977	21,940	255	0	0	0
1978	21,570	971	0	0	0
1979	29,486	1,708	0	0	0
1980	23,174	1,115	0	0	0
1981	18,504	1,185	0	0	0
1982	54,152	2,081	0	0	0
1983	83,529	2,754	0	0	0
1984	60,087	2,069	0	0	0
1985	108,368	5,301	898	0	338
1986	258,932	n.a.	10,262	0	175
1987	145,883[c]	n.a.	451[d]	600[d]	119[e]

n.a. = not available.

a. Guaranteed by federal or federally related agencies (Government National Mortgage Association, Federal Home Loan Mortgage Corporation, Federal National Mortgage Association). Excludes securities issued and guaranteed by the Farmers Home Administration (FmHA). Since 1975 all FmHA pass-throughs have been sold to the Federal Financing Bank.

b. Public offerings and private placements of pass-through securities not guaranteed by federal or federally related agencies.

c. Through June: estimate by Board of Governors of the Federal Reserve System.

d. Through April.

e. Through August 7.

SOURCE: Board of Governors of the Federal Reserve System.

TABLE A–5

Activities Approved and Denied by the Federal Reserve Board as "Closely Related to Banking" under Section 4(c)(8) of the Bank Holding Company Act

Permitted by Regulation[a]	*Year Added*
Making, acquiring, or servicing loans or other extensions of credit, such as would be made by mortgage, finance, credit card, or factoring companies	1971
Operating as an industrial bank, Morris Plan bank, or industrial loan company	1971
Conducting trust or fiduciary activities[b]	1971
Acting as investment or financial adviser[c]	1971
Full-payout leasing of personal and real property[d]	1971
Investing in community welfare projects	1971
Providing data processing services[e]	1971
Acting as insurance agent or broker primarily in connection with credit extensions[f]	1971
Underwriting credit life and credit accident and health insurance related to an extension of credit	1972
Providing courier services	1973
Providing management consulting advice to unaffiliated bank and nonbank depository institutions[g]	1974
Issuance and sale at retail of money orders with a face value of not more than $1,000, savings bonds, and traveler's checks[h]	1979
Performing appraisals of real estate	1980
Performing appraisals of personal property	1986
Arranging commercial real estate equity financing[i]	1983
Conducting securities brokerage activities[j]	1982
Underwriting and dealing in government obligations and money market instruments[k]	1984
Providing foreign exchange advisory and transmittal services[k]	1984
Engaging in futures commission merchant activities[k]	1984
Providing investment advice on financial futures and options on futures	1986
Engaging in consumer financial counseling	1986
Providing tax planning and preparation services	1986
Providing check guaranty services	1986
Operating a collection agency	1986
Operating a credit bureau	1986

(Table continues)

TABLE A–5 (continued)

Permitted by Order on an Individual Basis[1]	*Year Approved*
Operating a "pool-reserve plan" for the pooling of loss reserves of banks with respect to loans to small businesses	1971
Operating a thrift institution in Rhode Island	1972
Buying and selling gold and silver bullion and silver coin	1973
Operating a guaranty savings bank in New Hampshire	1975
Operating an Article XII New York investment company	1977
Engaging in commercial banking activities through foreign branches of a nonbank Delaware company	1982
Acquiring and operating a distressed S&L	1982
Operating a limited-purpose national bank for purposes of avoiding usury ceilings	1983
Operating a nonbank bank through a limited-purpose commercial bank charter	1984
Providing financial feasibility studies for private corporations; performing valuations of companies and of large blocks of stock for a variety of purposes; providing expert witness testimony on behalf of utility firms in rate cases	1986
Engaging in FCM (futures commission merchant) brokerage of futures contracts on a municipal bond index and related futures advisory services	1985
Engaging in FCM brokerage of futures contracts on stock indexes and options on such contracts	1985
Issuing consumer-type payment instruments having a face value of not more than $10,000	1986
Credit card authorization services and lost or stolen credit card reporting services	1985
Engaging in employee benefits consulting activities	1985
Issuing official checks with no limitation on the maximum face value but subject to certain limitations	1985
Providing expanded student loan servicing activities	1985
Underwriting and reinsuring home mortgage redemption insurance	1986
Providing portfolio investment advice in connection with securities brokerage services subject to certain conditions	1986
Printing and selling checks and related documents that require MICR-encoded information for depository institutions	1986
Engaging in commercial paper placement activities to limited extent	1986

TABLE A–5 (continued)

Permitted by Order on an Individual Basis[l]	*Year Approved*
Providing advice regarding the structuring of and arranging for loan syndications, interest rate "swap," interest rate "cap," and similar transactions	1986
Providing cash management services	1986
Activities Denied by the Board	***Year Denied***
Insurance premium funding ("equity funding") (combined sales of mutual funds and insurance)	1971
Underwriting general life insurance not related to credit extension	1971
Real estate brokerage	1972
Land development	1972
Real estate syndication	1972
General management consulting	1972
Property management	1972
Armored-car service[m]	1973
Sale of level-term credit life insurance	1974
Underwriting mortgage guarantee insurance	1975
Computer output microfilm services	1975
Operating a travel agency	1976
Operating a savings and loan association (except in certain states)	1977
Underwriting property and casualty insurance	1978
Real estate advisory activities	1980
Certain contract key entry services	1980
Offering investment notes with transactional features	1982
Providing credit ratings on bonds, preferred stock, and commercial paper	1984
Acting as a specialist in foreign currency options on a securities exchange	1985
Title insurance activities (3/17/86 board letter concerning Independence Bancorp, Inc.)	1986
Design and assembly of hardware for the processing or transmission of banking and economic data	1986

a. Section 225.25(b) of Regulation Y.
b. Amended in 1974 to narrow in some respects and expand in others.
c. Expanded in 1972 to include advisory services to open-end investment companies.
d. Expanded in 1974 to include real property leases.

(Notes continue)

(Notes to table A–5 continued)

e. Expanded in 1982 to permit bank holding companies to engage in data processing and transmission services as specified by the board.
f. Scope narrowed to conform to court decisions in 1979 and 1981; in 1982 it was further narrowed by Title VI of the Garn–St Germain Depository Institutions Act.
g. Expanded in 1982 to include nonbank depository institutions.
h. This activity was initially approved by order on individual application (1973) and did not include the issuance of traveler's checks. In 1981 the activity was expanded to include issuance of such instruments. In 1984 the activity was expanded to provide for the issuance of money orders as part of the regulatory review and overhaul of Regulation Y, effective February 6, 1984.
i. Activity was initially approved by order on an individual application in July 1982. The amendment to Regulation Y that added this nonbank activity became effective on September 25, 1982.
j. Codifies a previous position taken by the board in acting on an individual application to acquire a retail discount securities broker.
k. This nonbank activity was approved as the result of a complete regulatory review and overhaul of Regulation Y, revised effective February 6, 1984.
l. In approving these activities, the board did so without expanding the list of permissible activities under section 225.25(b) of Regulation Y.
m. Board decided to take no action on this activity at the time courier services were added because the hearing record was inconclusive.
SOURCES: Board of Governors of the Federal Reserve System; Federal Reserve Bank of Atlanta.

TABLE A–6

Claims on Foreign Countries Held by U.S. Offices and Foreign Branches of U.S. Chartered Banks, 1975–1986

(billions of dollars, end of year figures)

	Total	*Developed Countries*	*OPEC*	*Non-OPEC Developing Countries*	*Offshore Banking Centers*	*Other*[a]
1975	167.0	98.7	6.9	34.2	19.4	7.8
1976	207.7	115.2	12.6	43.1	26.2	10.6
1977	239.4	133.9	17.6	50.0	26.1	11.8
1978[b]	266.2	144.1	22.7	52.6	31.0	16.0
1979	303.9	158.3	22.9	63.0	40.4	19.0
1980	352.0	183.7	22.7	77.4	47.0	21.4
1981	414.3	203.6	24.5	96.2	63.5	26.6
1982	436.1	213.1	26.9	106.5	66.0	23.7
1983	433.9	203.8	28.4	110.8	68.9	22.1
1984[c]	405.7	181.7	24.9	111.8	65.6	21.7
1985	391.9	178.9	21.6	105.1	65.4	21.1
1986	391.9	184.2	19.5	99.3	65.5	23.3
			Percentage of Total			
1975	100.0	59.1	4.1	20.5	11.6	4.7
1976	100.0	55.5	6.1	20.8	12.6	5.1
1977	100.0	55.9	7.4	20.9	10.9	4.9
1978[b]	100.0	54.1	8.5	19.8	11.6	6.0
1979	100.0	52.1	7.5	20.7	13.3	6.3
1980	100.0	52.2	6.4	22.0	13.4	6.1
1981	100.0	49.1	5.9	23.2	15.3	6.4
1982	100.0	48.9	6.2	24.4	15.1	5.4
1983	100.0	47.0	6.5	25.5	15.9	5.1
1984[c]	100.0	44.8	6.1	27.6	16.2	5.3
1985	100.0	45.6	5.5	26.8	16.7	5.4
1986	100.0	47.0	5.0	25.3	16.7	5.9

Note: The banking offices covered by these data are the U.S. offices and foreign branches of U.S.-owned banks and of U.S. subsidiaries of foreign-owned banks. Offices not covered include (1) U.S. agencies and branches of foreign-owned banks and (2) foreign subsidiaries of U.S. banks. To minimize duplication, the data are adjusted to exclude the claims on foreign branches held by a U.S. office or another foreign branch of the same banking institution.

a. Eastern Europe, miscellaneous, and unallocated.

b. Beginning with data for June 1978, the claims of the U.S. offices include only banks' own claims payable in dollars. For earlier dates the claims of the U.S. offices also include customer claims and foreign currency claims (amounting to $10 billion in June 1978).

(Notes continue)

(Notes to table A–6 continued)

c. Beginning with June 1984 data, reported claims held by foreign branches have been reduced by an increase in the reporting threshold for "shell" branches from $50 million to $150 million equivalent in total assets, the threshold now applicable to all reporting branches.

SOURCE: Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*, table 3.21, various issues.

TABLE A–7

ASSETS OF FOREIGN BRANCHES OF U.S. BANKS, 1969–1987
(billions of dollars, end of period figures)

	Foreign Branches[a]	*Shell Branches*[b]	*IBFs*[c]
1969	33.4	3.0	0.0
1970	42.5	4.7	0.0
1971	52.8	8.5	0.0
1972	66.9	13.1	0.0
1973	98.1	23.8	0.0
1974	120.2	31.7	0.0
1975	131.3	45.2	0.0
1976	152.6	66.8	0.0
1977	179.8	79.1	0.0
1978	215.1	91.7	0.0
1979	255.3	108.9	0.0
1980	277.3	123.8	0.0
1981	313.7	149.1	n.a.
1982	324.3	145.2	64.4
1983	325.0	152.1	82.3
1984	306.9	146.8	85.9
1985	315.9	142.1	90.4
1986	314.0	142.6	80.3
1987	338.4[d]	146.4[d]	81.4[e]

n.a. = not available.

a. Assets of branches in all foreign countries less assets of branches in the Bahamas and Cayman Islands.

b. Assets of branches in the Bahamas and Cayman Islands.

c. International banking facilities (IBFs) were authorized on December 3, 1981. Figures shown are assets of IBFs of large U.S.-chartered banks that file a weekly report of condition (FR 2416). Total IBF assets—including nonweekly reporting banks, agencies and branches of foreign banks, and U.S. offices of Edge and Agreement corporations—were $56.6 billion in 1981, $152.7 billion in 1982, $191.6 billion in 1983, $227.6 billion in 1984, $260.5 billion in 1985, $298.2 billion in 1986, and $295.8 billion in March 1987.

d. April 30, 1987.

e. March 25, 1987.

SOURCES: Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin*, table 3.14, various issues; and Federal Reserve Release G.14, *Monthly Report of Assets and Liabilities of International Banking Facilities*.

TABLE A–8

Assets of Foreign Banks in the United States in Relation to Assets of Domestically Owned Banks, 1973–1986
(end of year figures)

	U.S. Offices of Foreign Banks[a] *(billions of dollars)*	*Domestically Owned Banks plus U.S. Offices of Foreign Banks*[b] *(billions of dollars)*	*Relative Importance of Foreign Bank Assets (percent)*
1973	32.3	855.8	3.8
1974	46.1	944.5	4.9
1975	52.4	988.0	5.3
1976	61.3	1,054.5	5.8
1977	76.8	1,193.5	6.4
1978	109.1	1,356.0	8.0
1979	149.6	1,513.0	9.9
1980	200.6	1,680.2	11.9
1981	250.6	1,862.3	13.5
1982	299.8	2,077.6	14.4
1983	328.8	2,251.1	14.6
1984	394.4	2,482.3	15.9
1985	440.8	2,730.5	16.1
1986	524.3	3,024.1	17.3

a. Data include assets of agencies, branches, subsidiary commercial banks, New York investment companies, and international banking facilities. Edge and Agreement corporations and U.S. offices of Puerto Rican banks are not included.

b. Data include assets of U.S. offices of foreign banks (as in first column) plus assets of domestically owned commercial banks. Latter exclude commercial banks with more than 25 percent foreign bank ownership, Edge and Agreement corporations, and U.S. offices of Puerto Rican banks but include commercial banks owned by nonbank foreigners.

Source: Board of Governors of the Federal Reserve System.

TABLE A–9

VOLUME OF FUNDS TRANSFERRED THROUGH ELECTRONIC PAYMENTS NETWORKS, 1970–1987
(average daily dollar volume in billions of dollars)

Year	*Fedwire*[a]	*CHIPS*[b]
1970	30.0	3.0
1971	36.4	4.5
1972	44.0[c]	19.0
1973	57.6	36.7
1974	74.8	42.8
1975	77.2	43.9
1976	87.6	52.6
1977	106.0	64.8
1978	124.0	81.4
1979	193.2	107.4
1980	193.2	147.5
1981	230.8	160.4
1982	296.0	211.0
1983	351.2	240.3
1984	392.0	276.5
1985	436.4	313.6
1986	500.0	425.0
1987[d]	530.0[e]	520.0

a. Electronic payments system operated by Federal Reserve. Converted here to daily averages by dividing by approximate number of working days per year (250).
b. The Clearing House Interbank Payments System, operated by the New York Clearing House Association. Established on April 6, 1970.
c. In 1972 electronic transfer of funds replaced telegrams.
d. Through May.
e. Estimate by Federal Reserve Bank of New York.
SOURCES: Fedwire: Board of Governors of the Federal Reserve System; CHIPS: Federal Reserve Bank of New York.

TABLE A–10

DEPOSIT BALANCES AT COMMERCIAL BANKS AND THRIFT INSTITUTIONS AND MONEY MARKET MUTUAL FUNDS, 1959–1986

(December averages of daily figures in billions of dollars, seasonally adjusted)

	Demand Deposits	*Saving Deposits*	*Small-Denomination Time Deposits*	*Large-Denomination Time Deposits*	*Other Checkable Deposits (OCDs)*	*Money Market Deposit Accounts (MMDAs)*	*Term Repurchase Agreements (RPs)*	*Term Eurodollars*	*Overnight RPs and Eurodollars*	*Money Market Mutual Fund Balances (MMMFs)*
1959	111.6	146.4	11.4	1.2	0.0	0.0	0.0	0.7	0.0	0.0
1960	112.5	159.1	12.5	2.0	0.0	0.0	0.0	0.8	0.0	0.0
1961	116.5	175.5	14.8	3.9	0.0	0.0	0.0	1.4	0.0	0.0
1962	118.2	194.8	20.1	7.0	0.0	0.0	0.0	1.6	0.0	0.0
1963	121.7	214.4	25.5	10.8	0.1	0.0	0.0	1.9	0.0	0.0
1964	127.0	235.2	29.2	15.2	0.1	0.0	0.0	2.4	0.0	0.0
1965	132.5	256.9	34.5	21.2	0.1	0.0	0.0	1.7	0.0	0.0
1966	134.6	253.1	55.0	23.1	0.1	0.0	0.0	2.1	0.0	0.0
1967	143.9	263.7	77.8	30.9	0.1	0.0	0.0	2.1	0.0	0.0
1968	155.1	268.9	100.5	37.4	0.1	0.0	0.0	2.9	0.0	0.0
1969	158.8	263.7	120.4	20.4	0.1	0.0	2.6	2.7	2.2	0.0

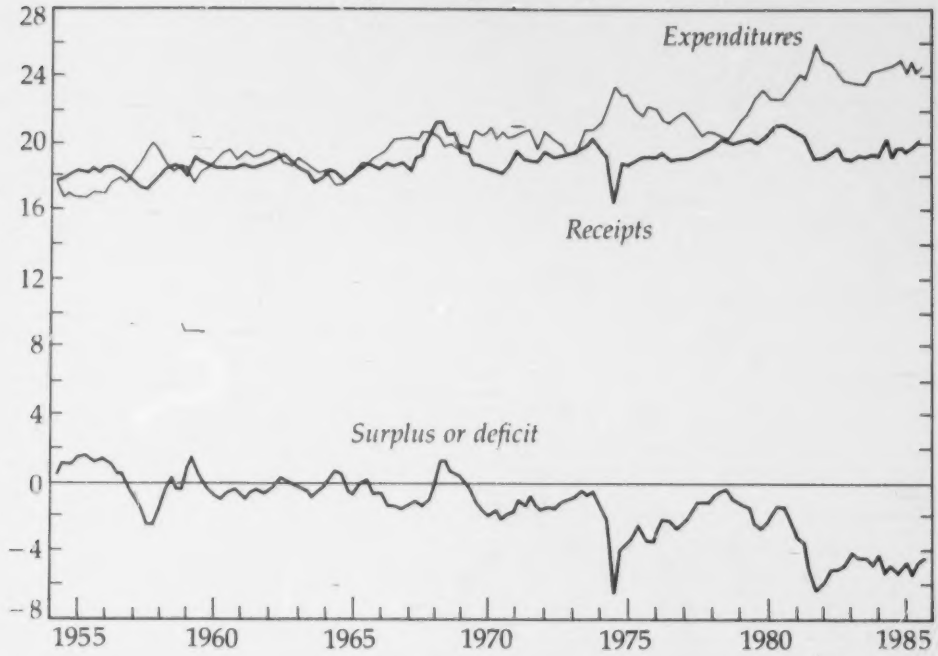
1970	166.3	261.0	151.1	45.2	0.1	0.0	1.6	2.2	1.3	0.0
1971	176.9	292.2	189.7	57.7	0.2	0.0	2.7	2.7	2.3	0.0
1972	193.7	321.4	231.6	73.3	0.2	0.0	3.5	3.6	2.8	0.0
1973	202.4	326.7	265.8	111.1	0.3	0.0	6.8	5.4	5.3	0.1
1974	207.4	338.5	287.9	144.8	0.4	0.0	7.9	8.0	5.6	1.9
1975	214.1	388.8	337.9	129.7	0.9	0.0	8.2	9.7	5.8	3.1
1976	224.3	453.1	390.8	118.1	2.7	0.0	14.0	14.8	10.6	3.0
1977	239.4	492.2	445.7	145.0	4.2	0.0	19.1	20.2	14.7	3.3
1978	253.5	482.0	521.5	195.1	8.5	0.0	26.6	31.8	20.3	9.5
1979	261.1	423.9	635.3	222.1	17.4	0.0	29.5	44.7	21.2	42.9
1980	265.3	401.4	730.2	259.0	28.0	0.0	34.0	50.3	28.3	76.8
1981	234.6	344.8	825.1	301.8	78.0	0.0	36.0	67.5	35.9	188.6
1982	237.9	357.9	852.8	327.8	103.4	43.2	34.5	81.7	38.8	236.3
1983	242.7	306.6	785.2	329.9	131.3	379.2	51.8	91.5	53.8	181.4
1984	248.4	289.7	887.5	413.9	146.3	417.0	62.2	83.1	56.3	230.2
1985	271.5	303.6	880.3	436.5	178.6	512.0	66.0	76.7	70.3	241.1
1986	307.8	371.5	852.4	444.3	232.7	570.7	81.1	83.0	75.7	291.3

SOURCE: *Annual Report of Council of Economic Advisers*, January 1987, table B-65.

FIGURE A–5

FEDERAL RECEIPTS, EXPENDITURES, AND SURPLUS OR DEFICIT, 1955–1986

(percentage of GNP)



SOURCE: Based on data compiled by Office of Management and Budget and Department of Commerce, Bureau of Economic Analysis.

TABLE A–11
U.S. Current Account Balance, 1955–1986
(billions of dollars)

	Current Account Balance	*Merchandise Exports*	*Merchandise Imports*	*Services, Net*[a]	*Other, Net*[b]
1955	0.4	14.4	−11.5	2.7	−5.2
1960	2.8	19.7	−14.8	3.1	−5.1
1965	5.4	26.5	−21.5	5.5	−5.1
1970	2.3	42.5	−39.9	6.5	−6.8
1971	−1.4	43.3	−45.6	7.6	−6.7
1972	−5.8	49.4	−55.8	8.1	−7.5
1973	7.1	71.4	−70.5	12.4	−6.2
1974	2.0	98.3	−103.8	16.6	−9.1
1975	18.1	107.1	−98.2	14.8	−5.6
1976	4.2	114.7	−124.2	18.4	−4.8
1977	−14.5	120.8	−151.9	20.1	−3.5
1978	−15.4	142.1	−176.0	23.5	−4.9
1979	−1.0	184.5	−212.0	34.5	−7.9
1980	1.9	224.3	−249.7	37.2	−9.8
1981	6.3	237.1	−265.1	42.9	−8.6
1982	−8.7	211.2	−247.6	37.0	−9.2
1983	−46.2	201.8	−268.9	30.6	−9.7
1984	−107.0	219.9	−332.4	19.6	−14.1
1985	−116.4	215.9	−338.1	24.4	−18.6
1986	−141.4	224.4	−368.7	22.3	−19.3

a. Investment income, travel and transportation receipts, and other services.
b. Military transactions plus remittances, pensions, and other unilateral transfers.
Source: Department of Commerce, *Survey of Current Business*, various issues.

TABLE A–12

DEBT OUTSTANDING, UNITED STATES, 1955–1987
(percentage of GNP)

	Total	*U.S. Government*	*State and Local Government*	*Households*		*Nonfinancial Business*	
				Mortgages	Consumer credit	Long-Term	Short-Term
1955	135.8	56.6	11.4	20.5	11.2	23.6	10.3
1960	141.1	45.8	14.0	26.6	12.6	26.6	12.4
1965	143.5	37.2	14.6	30.4	14.6	28.6	14.4
1970	141.0	29.6	14.7	28.6	14.1	32.2	17.3
1973	140.6	25.7	14.2	29.2	15.0	33.5	18.4
1974	141.4	24.5	14.1	29.3	14.5	34.1	20.2
1975	142.0	27.9	13.8	29.4	13.7	34.4	18.2
1976	140.8	28.9	13.1	29.7	13.7	33.6	17.4
1977	142.1	28.8	12.3	31.1	14.2	33.6	17.8
1978	142.0	27.8	11.6	32.3	14.6	32.8	18.5
1979	142.8	26.5	11.1	33.8	14.8	32.4	19.9
1980	143.7	27.2	10.8	34.5	13.8	32.3	20.2
1981	140.9	27.2	9.9	33.5	13.1	31.0	21.1
1982	147.8	31.3	10.2	33.6	13.2	31.9	21.9
1983	153.6	34.6	10.5	34.5	13.9	32.5	21.8
1984	159.0	36.6	10.2	34.6	15.1	33.5	23.4
1985	171.4	40.0	12.3	36.3	16.7	36.0	23.7
1986	182.6	43.1	13.1	39.1	17.2	39.1	24.6
1987[a]	179.3	42.1	13.0	38.9	16.7	38.8	23.8

a. First quarter, seasonally adjusted.
SOURCE: Based on data from Board of Governors of the Federal Reserve System, Flow of Funds Accounts.

TABLE A–13

Banks Closed because of Financial Difficulties and Their Deposits, 1955–1986

Period[a]	*Number of Banks*	*Total Deposits (millions of dollars)*
1955–59	5	9.8
1960–64	5	14.0
1965–69	7	45.0
1970	8	55.2
1971	6	132.1
1972	3	99.8
1973	6	971.3
1974	4	1,575.8
1975	14	340.6
1976	17	865.7
1977	6	205.2
1978	7	854.2
1979	10	110.7
1980	10	216.3
1981	10	3,826.0
1982	42	9,908.4
1983	48	5,441.6
1984	79	2,883.2
1985	118	8,059.4
1986	138	6,009.8

a. Figures for first three periods are five-year averages.
Source: Federal Deposit Insurance Corporation.

TABLE A–14

EXTERNAL ASSETS AND LIABILITIES OF THE U.S. ECONOMY, SELECTED YEARS, 1952–1986
(billions of dollars outstanding at year end unless otherwise indicated)

	1952	*1962*	*1972*	*1975*	*1978*	*1981*	*1983*	*1985*	*1986*
U.S. assets abroad	59.1	96.7	198.7	295.1	447.9	719.8	873.9	949.4	1,067.9
U.S. official reserve assets[a]	24.7	17.2	13.2	16.2	18.7	30.1	33.7	43.2	48.5
Other assets of U.S. government	11.7	19.2	36.1	41.8	54.2	68.7	79.5	87.7	89.5
Assets of private U.S. residents	22.7	60.3	149.4	237.1	375.0	621.1	760.7	818.5	929.9
Direct investments	14.7	37.3	89.9	124.1	162.7	228.3	207.2	229.7	259.9
Foreign securities	4.7	11.9	27.4	34.9	53.4	63.4	83.8	112.8	131.1
Claims reported by nonbanks on unaffiliated foreigners	1.8	3.9	11.4	18.3	28.1	35.9	35.1	28.6	32.6
Claims reported by banks[b]	1.5	7.3	20.7	59.8	130.8	293.5	434.5	447.4	506.4
Foreign assets in the United States	20.8	46.3	161.7	220.9	371.7	578.7	784.3	1,061.3	1,331.5
Foreign official assets[c]	5.0 E	14.0 E	63.0	86.9	173.1	180.4	194.5	202.5	240.8
Other foreign assets in the United States	16.0 E	32.0 E	98.7	134.0	198.7	398.3	589.8	858.8	1,090.7
Direct investments	3.9	7.6	14.9	27.7	42.5	108.7	137.1	184.6	209.3
Securities other than U.S. Treasury securities	n.a.	n.a.	50.7	45.7	53.6	75.1	113.7	206.6	309.5
Liabilities reported by U.S. nonbanks to unaffiliated foreigners	n.a.	n.a.	10.7	13.9	16.0	30.6	26.9	29.4	26.7
Liabilities reported by U.S. banks to nonofficial foreigners[d]	4.6 E	9.2 E	22.4	46.7	86.6	183.9	312.2	438.1	545.1
Net external asset position	38.3	50.4	37.0	74.2	76.1	141.1	89.6	−111.9	−263.6
U.S. gross domestic product[e]	349.5	570.2	1,201.6	1,580.9	2,219.1	3,000.5	3,355.9	3,957.0	4,168.9

Ratio of external assets other than held by the U.S. government to GDP (%)	6.5	10.6	12.4	15.0	16.9	20.7	22.7	20.7	22.3
Ratio of external liabilities to GDP (%)	6.0	8.1	13.5	14.0	16.8	19.3	23.4	26.8	31.9

E—estimated by Ralph C. Bryant, Senior Fellow, Brookings Institution.
n.a. = not available.
a. The U.S. gold stock is valued at $35 per ounce before May 1972, at $38 per ounce between May 1972 and October 1973, and thereafter at $42.22 per ounce. Foreign currency reserves are valued at exchange rates at time of purchase through 1973 and at current exchange rates thereafter.
b. Includes claims on foreign residents of banking offices in the United States owned by foreigners and (since December 1981) of international banking facilities and claims on foreign residents held in custody by U.S. banking offices for customers resident in the United States.
c. Includes U.S. government securities owned by foreign institutions and claims of foreign official institutions on banking offices in the United States.
d. Includes U.S. Treasury securities held by nonofficial foreigners. Also includes liabilities to foreign residents of banking offices in the United States owned by foreigners and (since December 1981) of international banking facilities and liabilities of U.S. nonbanks to nonofficial foreigners held in custody and reported by U.S. banking offices.
e. Billions of dollars in current prices, annual flow.
SOURCES: Through 1985: Ralph C. Bryant, *International Financial Intermediation* (Washington, D.C.: Brookings Institution, 1987), table 3–6, based mainly on data from the U.S. Department of Commerce, *Survey of Current Business*, various issues. Data for 1981–1985 have been revised. For 1986: U.S. Department of Commerce, *Survey of Current Business* (June 1987), table 2.

TABLE A–15

INDICATORS OF INTERNATIONAL BANKING, UNITED STATES, SELECTED YEARS, 1952–1986
(billions of dollars at end of year unless otherwise indicated)

	1952	1962	1972	1975	1978	1981	1983	1985	1986	Compound Annual Rate of Growth, 1952–86
A. Claims of U.S. banking offices on foreign residents[a]										
1. Total reported[b]	1.5	7.3	20.7	59.8	130.9	293.5	434.5	447.8	504.5	18.7
2. Banks' own claims	1.0 E	6.2 E	15.5 E	51.5 E	119.3	256.6	398.5	418.2	468.7	19.8
B. Liabilities of U.S. banking offices to foreign residents[a]										
1. Total reported[c]	9.3	22.0	61.7	96.2	169.2	247.4	374.8	451.1	567.3	12.9
2. Banks' own liabilities denominated in dollars	6.1 E	11.7 E	25.0 E	51.0 E	78.7	163.8	279.1	341.1	404.4	13.1
C. Total assets of foreign branches of U.S.-chartered banks[d]	1.3 E	4.3 E	78.2	176.5	305.8	462.8	477.1	458.0	456.6	18.8
D. Consolidated claims on unaffiliated foreigners at domestic offices and										

foreign branches of U.S.-chartered banks[e]	1.7 E	7.5 E	71.5 E	167.0	266.2	415.2	433.9	391.9	391.7	17.4
E. Total assets at domestic offices[f]										
1. U.S.-chartered commercial banks	189.6 E	298.1 E	740.8	957.2	1,278.2	1,692.3	2,032.3	2,383 E	2,683[h]	8.1
2. All U.S. commercial banking institutions	191.0 E	302.7 E	763.6	1,004.8	1,380.1	1,881.8	2,281.1	2,680 E	3,064[h]	8.5
F. Gross domestic product (annual rate during calendar year)[g]	349.5	570.2	1,201.6	1,580.9	2,219.1	3,000.5	3,355.9	3,957.0	4,168.9	7.6
G. International trade in goods and services (annual rate during calendar year)[g]	17.6	29.6	79.8	145.8	225.4	365.9	355.6	409.2	433.4	9.9

E—Partially estimated by Ralph C. Bryant, Senior Fellow, Brookings Institution.

a. Banking institutions reporting these data include U.S.-chartered commercial banks, U.S. agencies and branches of foreign banks, domestic offices of Edge and Agreement corporations, New York investment company subsidiaries of foreign banks, and (after December 1981) international banking facilities. The United States includes Puerto Rico, the Virgin Islands, and other overseas U.S. territories and possessions.

b. Includes claims held in custody for domestic customers.

c. Includes custody liabilities such as U.S. government securities owned by foreigners.

d. Series contains minor discontinuities due to changes in reporting requirements. Estimates for 1952 and 1962 are based on end-year condition reports published in Federal Reserve Board annual reports.

e. These data are adjusted to exclude "intrafamily" assets and liabilities (the claims on their foreign branches held by U.S. offices

(Notes continue)

(Notes to table A–15 continued)

of a banking organization and the claims of one foreign branch of a banking organization on other foreign branches of the same organization). Reporting institutions include only U.S.-chartered banks.

f. Data for 1952–1983 are based on end-year condition reports. The figures for 1985 were estimated by Ralph C. Bryant on the basis of the last-Wednesday-of-month series. The figures for 1986 were estimated here on the same basis.

g. International trade (in both goods and services) is defined as the arithmetic average of exports and imports. Annual rate during calendar year.

h. Estimate compatible with that for 1985.

SOURCES: For data through 1985: Ralph C. Bryant, *International Financial Intermediation* (Washington, D.C.: Brookings Institution, 1987), table 3–7, based on data from the following sources: U.S. Department of Commerce, *Survey of Current Business;* and Board of Governors of the Federal Reserve System, *Banking and Monetary Statistics; 1941–1970, Annual Statistical Digests,* and *Federal Reserve Bulletin,* various issues. Certain data for 1983 and 1985 have been revised. For 1986: U.S. Department of Commerce, *Survey of Current Business* (June 1987); and Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin,* various issues.

TABLE A-16

INTERNATIONAL BANKING IN RELATION TO BANKS' TOTAL ASSETS AND TO INTERNATIONAL TRADE, UNITED STATES, SELECTED YEARS, 1952–1986

(percent)

Indicator	*1952*	*1962*	*1972*	*1975*	*1978*	*1981*	*1983*	*1985*	*1986*
International banking as a proportion of total assets at banks' domestic offices									
1. Own claims of U.S. banking offices on foreign residents (to total assets at domestic offices of all commercial banking institutions)	0.5 E	2.0 E	2.0 E	5.1 E	8.6	13.6	17.5	15.6	15.3
2. Own dollar liabilities of U.S. banking offices to foreign residents (to total assets at domestic offices at all commercial banking institutions)	3.2 E	3.9 E	3.3 E	5.1 E	5.7	8.7	12.2	12.7	13.2
3. Consolidated claims on unaffiliated foreigners at domestic offices and foreign branches of U.S.-chartered banks (to total assets at domestic offices of U.S.-chartered banks)	0.9 E	2.5 E	9.7 E	17.4	20.8	24.5	21.4	16.4	14.6
International banking in relation to international trade in goods and services									
4. Own claims of U.S. banking offices on foreign residents (all commercial banking institutions)	5.7 E	20.9 E	19.4 E	35.3 E	52.9	70.1	112.1	102.2	108.1
5. Own dollar liabilities of U.S. banking offices to foreign residents (all commercial banking institutions)	34.7 E	39.5 E	31.3 E	35.0 E	34.9	44.8	78.5	83.4	93.3
6. Consolidated claims on unaffiliated foreigners at									

(Table continues)

TABLE A–16 (concluded)

Indicator	*1952*	*1962*	*1972*	*1975*	*1978*	*1981*	*1983*	*1985*	*1986*
domestic offices and foreign branches of U.S.-chartered banks	9.7 E	25.3 E	89.6 E	114.5	118.1	113.5	122.0	95.8	90.4
7. U.S. international trade in goods and services as percentage of U.S. gross domestic product	5.0	5.2	6.6	9.2	10.2	12.2	10.6	10.3	10.4

E—Underlying series partly estimated by Ralph C. Bryant, Senior Fellow, Brookings Institution.
SOURCE: Derived from table 15. The correspondence between rows in this table and rows in table 15 is as follows (row numbers in table 15 in parentheses): row 1 (A2/E2); row 2 (B2/E2); row 3 (D/E1); row 4 (A2/G); row 5 (B2/G); row 6 (D/G); row 7 (G/F).

TABLE A–17

NEW LENDING FACILITIES ARRANGED IN INTERNATIONAL FINANCIAL MARKETS, 1981–1986
(billions of dollars)

	1981	*1982*	*1983*	*1984*	*1985*	*1986*
International bond issues	44.0	71.6	72.0	107.9	163.7	220.3
Fixed-rate straight issues	32.1	55.9	46.9	62.0	96.2	145.4
Floating-rate notes	7.8	12.6	15.3	34.0	55.9	47.8
Convertible bonds[a]	4.1	3.2	9.9	11.9	11.6	27.1
Note issuance facilities[b]	1.0	2.3	3.3	18.8	49.5	69.5
Syndicated bank lending[c]	131.5[d]	99.4	51.8	36.6	21.1	37.8
Voluntary loans	131.5	88.2	38.1	30.1	18.8	29.8
"Nonspontaneous" loans[e]	0.0	11.2	13.7	6.5	2.3	8.0
Total of new facilities	176.5	173.3	127.1	163.3	234.3	327.6
Securities-market facilities as percentage of total new facilities	25.5	42.6	59.2	77.6	91.0	88.5

a. Includes bonds with equity warrants.
b. Covers all Euro-note facilities including underwritten facilities (NIFs, RUFs, and multiple-component facilities with a note issuance option) and nonunderwritten or uncommitted facilities and Euro–commercial paper programs.
c. Does not include existing loans newly negotiated where only spreads are changed.
d. Includes $35 billion of U.S. takeover-related standbys.
e. The new-money element of rescue packages arranged for heavily indebted countries by the International Monetary Fund and other governmental entities in cooperation with commercial banks.
SOURCES: For data through 1985: Ralph C. Bryant, *International Financial Intermediation* (Washington, D.C.: Brookings Institution, 1987), table 3–13, based on data from Bank for International Settlements, *Fifty-sixth Annual Report* (Basel, 1986), pp. 101–7. Certain data have been revised. For 1986: Bank for International Settlements, *Fifty-seventh Annual Report* (Basel, 1987), pp. 107–10.

TABLE A–18

FINANCIAL INNOVATIONS IN 1985

Instrument	*Description*
International markets	
Floating-rate coupon securities	
• Capped	Upper limit on coupon reset rate
• Mini/max	Upper and lower bounds set
• Mismatched	Coupon reset and coupon payment occur at different frequencies
• Partly paid	After initial payment for first part of an issue, purchaser must subscribe to future tranches
Nondollar FRNs	Introduction of deutsche-mark- and yen-denominated FRNs
Nondollar zero-coupon bonds	Introduction of deutsche-mark-, Swiss-franc-, and Japanese-yen-denominated issues
Shoguns	U.S. dollar bonds issued in Japan
Sushis	Eurobonds issued by Japanese entities that do not count against limits on holdings of foreign securities
Yen-denominated Yankees	Yen bonds issued in U.S. market
ECU-denominated securities	Increased utilization in U.S. markets; introduction of issues in Dutch and Japanese markets
Dual-currency yen bonds	Interest paid in yen, principal paid in other currency at a specified exchange rate
"Down-under" bonds	Increased utilization of Euro-Australian dollar and Euro–New Zealand dollar bond issues
Domestic markets	
Variable-duration notes	At coupon payment date, holder elects to receive either coupon or an additional note with identical terms
Zero-coupon convertible	Zero-coupon bond with option to convert to common stock
Collateralized securities	
• Multifamily pass-through	Pass-throughs collateralized by multifamily mortgages
• Lease backed	Collateralized by leases on plant and equipment

TABLE A–18 (continued)

Instrument	*Description*
• Automobile backed	Collateralized by automobile loans
• Revenue indexed	Mortgage-backed security in which interest payments are augmented by a percentage of issuer's gross earnings
Commercial real estate	
• Finite-life real estate investment trust	Portfolio of real estate equities with a specific date by which the portfolio must be liquidated
• Commercial mortgage pass-throughs	Pass-throughs collateralized by commercial mortgages
• Cross-collateralized pooled financing	Pooled securities allowing recourse to other mortgages in the pool
• Rated, pooled nonrecourse commercial mortgage	Publicly rated nonrecourse real estate–backed bonds
Tax-exempt securities	
• Daily adjustable tax-exempt securities	Puttable long-maturity bonds with coupon rate adjusted daily
• Zero coupon	Zero-coupon tax-exempts
• Capital appreciation bonds	Zero-coupon bonds sold at par or better
• Stepped tax-exempt appreciation on income-realization securities	Zero-coupon bonds for an initial period, after which they are converted to interest-bearing securities
• Municipal option put securities	Puttable bonds with detachable puts
• Periodically adjustable rate trust securities	Participant certificates based on tax-exempt commercial mortgage loans
Futures and Options	
Municipal bond contract	Introduction of futures contract to tax-exempt market
Options on Eurodollar futures	Introduction of exchange-traded options on futures to the short end of yield curve
Options on Treasury note futures	Introduction of exchange-traded options on futures to intermediate section of yield curve
Japanese government yen bond futures	Introduction of Japanese financial futures contracts
ECU warrants	Introduction in Europe of publicly offered and listed options on ECU

(Table continues)

TABLE A–18 (concluded)

Instrument	*Description*
European-style options	Introduction in United States of options that can only be exercised at expiration; in addition, currency strike prices are in European rather than American terms
Range forward contract	A forward-exchange contract that specifies a range of exchange rates for which currencies are exchanged on the expiration date
U.S. dollar index	Introduction of a futures contract on the dollar's trade-weighted value
Options on cash five-year Treasury notes	Introduction of options to this sector of the yield curve

NOTE: Instruments that either were introduced or became widely used during 1985.

SOURCE: Henry Kaufman, *Interest Rates, the Markets, and the New Financial World* (New York: Times Books, 1986).

Commentaries

Steven L. Husted

Dr. Burns's paper is an attempt to discuss the recent history of the American banking industry, especially as that history relates to the increase in competition American banks have begun to face from domestic and foreign competitors. The focus of the paper and perhaps its greatest strength is on the interplay between the government and the financial sector as the regulatory structure has evolved over the past thirty years. Many important messages are contained in the paper, but two seem especially worthy of note at the outset. First, the American banking system has gone through enormous changes over the past thirty years in the way it does business. These changes have come about in part because of changes in demand from customers and in part from changes in the competitive and regulatory environments. Furthermore, these changes are all the more important because they are irreversible. The second major point of the paper is that because of these changes in the activities of banks, bank regulation is much more difficult than ever and no less necessary.

Let me turn to some specific comments. First, the paper is remarkably short of data. [Before his death Dr. Burns instructed his AEI research associate, Dr. Arthur L. Broida, to compile data to support the paper. The resultant eighteen tables and five figures have been appended to Dr. Burns's paper.—Editors] I think the argument could be made much stronger by some indication concerning trends in bank performance. For instance, what has happened to deposits and to the composition of assets? What has happened to profitability? What is the volume of external versus internal activity? What about bank failures? In fact, I have the answer to this last question. From an early peak of about eighty in 1937, failures of FDIC-insured banks fell to a plateau of less than ten per year until the mid-1970s, when the failure rate began to rise slightly. Since 1981 bank failures have risen from about 10 to 120 per year. Does this pattern support Professor Burns's thesis that *deregulation* has increased the risk of systemic collapse? Or

are the failures more closely tied to the influence of monetary policy and terms-of-trade shocks and thus largely unrelated to deregulation?

Second, the paper has missed at least one salient feature of the commercial banking response to increased competition and deregulation—mergers. My impression—based, I admit, on casual observation—is that concentration within the commercial banking sector has risen, perhaps dramatically, as regulatory barriers have come down. This suggests that there may be considerable economies of scale in banking, economies that the regulatory structure until recently refused to allow banks to enjoy.

Let me turn now to several points on the need for and the role of regulation. First, Professor Burns argues that banks must be protected because they provide a crucial service to the economy—the payments mechanism. My only comment here is that, as Burns's paper emphasizes, the entire financial sector has lately shown a remarkable facility for innovation. This facility coupled with technological advance may well lead to a significant change in the near future in the payments system. It is not at all clear to me that banks will continue to dominate that system; if not, we need to ask if this diminishes the argument for regulatory protection.

As for protection, one wonders if the cure is not sometimes worse than the disease. For instance, because most U.S. banks have long been restricted from activity outside a narrow geographic area, the quality of their loan portfolios is tied very closely to the value of region-specific assets. Hence it is not surprising that, given the commodity and oil price collapses of the past few years, bank failures have risen, but have been concentrated in the farm belt and the oil-producing states.

Another point that might receive more attention in the paper is the conflict of interest that must exist inside the Federal Reserve as it acts on the one hand to safeguard banking through regulation and on the other to conduct monetary policy. Obviously, when it chooses to tighten, as it did significantly in the late 1930s and the early 1980s, commercial banks are in peril. Of course, the rise of inflation in the late 1960s that Professor Burns argues set off this revolution in banking clearly was rooted at least in part in Federal Reserve policy. One wonders, then, When does the goal of policy outweigh the risk of bank failure?

Let me turn away from the question of regulation to make one final point about the international dimension of banking. The United States has recently entered into a new round of talks aimed at liberalizing international trade. Our negotiators worked very hard to include trade in services on the agenda, obviously in the belief that the

United States has comparative advantage in this area. Yet we really do not know this to be true. To the extent that services differ from merchandise, our models have very little to say about the determination of comparative advantage in trade in services. One could make the case that in this age of low-cost funds transfer the production of banking services is likely to end up in those regions where regulation is the least onerous. What does this prospect pose for the future stability of the world financial system? What should the optimal policies be in such an environment?

James H. Cassing

Professor Arthur Burns's paper, "The Ongoing Revolution in American Banking," raises important questions and highlights issues for research. My comments will focus on some of these issues, with a special eye to the role of the university and curriculum development. As an organizing principle, I will follow the three themes of competition, securitization, and globalization of the banking industry.

I would like to stress two messages in particular. First, competition and securitization—unleashed by legislative changes and technical innovation—are indeed powerful forces, which reflect a real revolution in banking. Revolutions are not always for the better, however, and our attention should focus on banking as a special industry and the role of the regulator. Second, the globalization of banking introduces new opportunities but important new questions as well. In particular, governments acting independently can regulate or deregulate their domestic financial sectors, but international coordination and control are sovereign government-to-government processes that require cooperation and create policy issues in a more complex environment.

Professor Burns asserts that banking has seen a revolution since the 1950s, and most would agree that this is beyond question. A combination of technological and managerial innovation—computers and brain power—and legislative changes has been the impetus. Witness two recent pieces of legislation, the Depository Institutions Deregulation and Monetary Control Act and the Garn–St Germain Depository Institutions Act of 1982. Thus we have, more or less in one fell swoop, eliminated Regulation Q, introduced nationwide interest-bearing transaction accounts—NOW, super-NOW, and others—eased state usury ceilings, and allowed thrifts and others to sell bank-like

products such as commercial loans and credit cards. In addition, we have seen the rise of nonbanks operating interstate, underwriting commercial paper, and offering discount brokerage.

The first set of important issues leads us to ask: Do we want deregulation, reregulation, or maybe no regulation at all? To answer this, we need to know a number of things, and this invokes the traditional research role of the university. We need to understand the links between deregulation and banking system stability, the crisis and noncrisis implications of deregulation, the appropriate structure of the Federal Deposit Insurance Corporation in a deregulated world, and the interrelated roles of the Federal Reserve and the FDIC in preventing crises.

Dr. Burns hints in his paper that banking innovation complicates the regulators' task, which it surely does. At the same time, it seems to me, innovation might strengthen the case for deregulation. For example, lightning-fast capital flows and hot moneys can be worrisome. It is an advantage, however, for single banks to be able to have their cash reserves supplemented instantaneously, as, of course, is now technologically possible.

Nevertheless, bank failures have obviously increased dramatically, and bank risk is arguably higher than ever before for several reasons: declining asset quality, especially (but not exclusively) in the international loan portfolio (agriculture, energy, and housing have all been weak sectors); a trend toward purchased funds and more volatile (really, market) interest rates; and increased off-balance-sheet activities. This, however, leads one to ask, Is the increased risk so bad? The answer would depend on whether one thought that the banks had enough risk before. In any case, this leads to another very important question: Is the increased risk due to deregulation? Again, it can be argued that it is not. The decline in oil prices and the retreat of the International Monetary Fund from the international loan market occurred simultaneously with deregulation but may not have been forecastable. More regulation per se might or might not have changed anything. Once again, the research role of the university is brought into play.

We also need to know how the financial system would respond to a crisis but without having one first. In this area, however, many questions linger, and the research role of the university becomes apparent. What are the causes and costs of panics? What is the source of confidence or lack of confidence in the system? Is insurance the answer? Must insurance be government sponsored, or are bank deposit contracts a market arrangement designed to deal with uninsurable liquidity risks? Do these new steps encourage too much risk

taking, especially in light of capital forbearance? Today there is active research on many of these issues and especially on solutions compatible with incentives to reduce the risk of panics in a deregulated environment. Here I have in mind aggregate portfolio management by a lender of last resort, deposit insurance, and redesign of deposit contracts.

Needless to say, all of this directly affects our view of sound banking and monetary policy. Dr. Burns recounts vividly the problems of regulatory and monetary policy in an inflationary economy with new, innovative financial instruments at hand. To be sure, innovation by banks and others has made the policy maker's task harder. But capricious policy making can itself be destabilizing and make the banker's task harder.

So far, I have addressed essentially national banking issues. It seems to me, however, that the single most revolutionary banking event, created in part by new advanced technology hardware, has been the true internationalization of financial markets, or "globalization." Various bank departments are now staffed twenty-four hours a day as assets move instantaneously around the world. While trade flows have grown dramatically since 1951, from $77 billion to $1.5 trillion in 1986, the amount of foreign exchange traded by commercial banks annually is over forty times as large as the trade flows.

Our recent experience with monetary policy and its effect on real activity through the real exchange rate highlights the new environment. A combination of tight money and a loose fiscal policy probably induced the unprecedented rise in the real exchange rate, much to the chagrin of our exporters and import competitors. Consequently, there are now three seriously protectionist bills in Congress and talk of a retreat from flexible exchange rates. Furthermore, since government debts tend to become monetized, there is a real concern among our trading partners about future price stability. The continuing discussions between the United States, Japan, and West Germany clearly bring home that regulation is not accomplished by international fiat but must come about through agreement and policy coordination among governments.

Throughout these comments the role of the university and some directions for curriculum development become clear. The University of Pittsburgh has been in existence for 200 years and has numerous faculty members actively involved in raising and researching the hard questions of banking and monetary policy in a competitive international environment. The issues today, however, cut broadly across traditional departmental boundaries and are truly international. Our textbooks about the closed economy are indeed passé. Professor

Burns might even agree that a modern course on the theory of banking could easily borrow from information and computer sciences as much as from traditional economics and business. Risk management and international relations have surely found a place as well.

At the same time, the business community cannot be ignored. The great technological and managerial innovations of the past decades require a nuts-and-bolts knowledge of the industry. I see important mutual interests in merging the operations view of the managers with the systems view of the academics and policy makers.

I should quickly add that I view these suggestions as a strong vote of support for a truly liberal education. Flexibility and breadth of knowledge are more important than ever in a changing world. My only plea might be that our approach be a little more hands-on and a lot more cosmopolitan.

Finally, this approach is already beginning to be recognized and reflected in funding opportunities. Foundations such as Sloan, Rockefeller, Pew, Ford, Mellon, Carnegie, and MacArthur have targeted various problems connected with the coordination of open economies as key areas of research. Sloan, for example, has funded various AEI research programs. Large grants are continually committed to this area by domestic and foreign foundations. The German Marshall Fund, for instance, has contributed substantially to the Institute for International Economics and to the Center for European Policy Studies. To many of these foundations, an explicit appeal to an interdisciplinary approach is made. This can be perceived as the corporate world's way of recognizing the interaction of economics and other disciplines. I might go further: I would like to see the business community involved as well. I hope that the university in general and the University of Pittsburgh and the University Center for International Studies in particular will provide the infrastructure to lead us into the next 100 years.

Discussion

Burns's Reply to Comments by Husted

Professor Burns began his reply by addressing the question of regulatory reform. He reiterated the problem posed in his paper: because of the rapid pace of financial innovation as well as the internationalization of banking activities, regulation of the banking community has become increasingly difficult. Despite his growing concern over this issue, Burns had no recommendations that he could offer with any confidence. As an example of a solution he felt would not work, he recounted how, during his years at the Federal Reserve, he had opposed congressional efforts to create a single federal regulatory agency because of the harmful effects that such an agency might have had on the functioning of the Federal Reserve System. He had been especially concerned that if the regulatory authority were taken away from the Federal Reserve, those responsible for monetary policy "would learn little and know less and less about the actual working of our financial system."

Burns then addressed a criticism raised by Professor Husted that the arguments in the paper could be sharpened by offering data to support his claims. Burns agreed that his paper was short on data and promised to supply a statistical appendix. [A data appendix has since been added to the paper.—EDITORS]

Burns then discussed the evolving role of banking in the national payments system. He raised the possibility of a new financial system with two types of national institutions. One would be confined to the payments system, with bank deposits backed by Treasury securities. The other would be engaged in lending functions. One of the advantages of such an arrangement, Burns felt, would be that it would facilitate an overhaul of the deposit insurance system, a system "in need of drastic revision." Burns pointed out that insuring deposits up to $100,000 was excessive if the goal was to protect small households. In fact, in administering the insurance system, the effective level of protection was substantially higher. This, Burns argued, served only

to lower the quality of bank credit, since bankers need not fear any adverse consequences of their actions for the assets of their depositors.

Burns's Reply to Comments by Cassing

Burns used this opportunity to detail issues on which academic research programs should be concentrated. The first has to do with the externalities of events and the limitations imposed by territorial boundaries on governments seeking to deal with those externalities. Burns offered the Chernobyl nuclear accident and the pollution of the Rhine as examples of situations in which international cooperation was required. Similarly, because corporations have spread internationally by establishing foreign subsidiaries or licensing foreign partners, their actions may no longer be subject to government regulation or control. Thus international cooperation is needed to reestablish authority over those entities. Finally, macroeconomic policies undertaken by governments also have international repercussions that must be considered when policies are formulated. For all these reasons, Burns noted, "one of the subjects that scholars ought to concern themselves with is how economic cooperation or cooperation among countries more generally can be achieved."

Another area ripe for study is the enormous explosion of debt throughout the American economy. Burns cited the dramatic growth since 1980 of the ratio of indebtedness in both the public and the private sectors. This he felt must point to some common, but still unidentified, causal factor.

Burns argued that scholars should investigate whether the Glass-Steagall Act, which prohibits commercial banks from investment banking activities, should be repealed. Noting that the profits of investment banks were out of line with the profits of commercial banks, Burns stated that the depression-era analysis emphasizing that investment banking activities were inherently riskier may have been invalid. This, along with the considerable changes in the financial world since the law was passed, seems to imply that the act unnecessarily restricts commercial bank behavior.

Returning to the issue of bank regulation, Burns referred to a plan offered by E. Gerald Corrigan, president of the Federal Reserve Bank of New York, as a proposal that should undergo scholarly examination. He repeated a point raised in his paper: that bank financial statements had become difficult to interpret because of the magnitude of off-balance-sheet items. The effect of these items on banks' behavior needs to be better understood, especially for pur-

poses of regulation and control. Along these latter lines, Burns described a recent agreement between the Federal Reserve and the Bank of England under which new, uniform capital requirements would be adopted in both countries and the riskiness of off-balance-sheet items would be evaluated. Burns felt that agreements such as this should be expanded to include more countries. Scholarly input is required to determine what the nature of cooperation should be.

General Discussion

AMBASSADOR LAYACHI YAKER, one-time Algerian ambassador to the United States and to the Soviet Union, began the floor discussion by asking Professor Burns what the developed countries—especially the United States—should be doing to alleviate the debt problems of the developing countries. Burns commented that there was plenty of blame on both sides for the current debt crisis—borrowers who borrowed too much and banks all too willing to lend without adequately investigating the situation. Burns went on to note that he had expressed great concern to the commercial banking community as early as 1975 that the foreign loans they were entering into were potentially very dangerous. He pointed out that it is now the duty of commercial bankers to work out new arrangements with the borrowing countries. The main barrier to reaching new agreements, he felt, was that these loans typically involve a consortium of lenders rather than a single bank. Reaching an agreement on the terms of any new arrangement poses additional difficulties. A further problem is that different countries are in different states of distress.

With respect to specific government policies, Burns praised the plan put forward by Treasury Secretary James Baker that calls for debt restructuring as well as some new loans. He noted with dismay the capital flight from developing countries back to the United States or to third countries because residents of many debtor countries have little confidence in the policies of their own governments. He called on these governments to implement sounder financial policies. He spoke disparagingly of any plan to call a large-scale international conference to deal with the issue, arguing that such conferences were bound to be chaotic, "a public show, [with] many speeches, many wild proposals," and no sound agreement.

PETER GRAY of Rutgers University turned the discussion to international cooperation on regulation. He wondered if, given the experience that the industrial economies have had with economic summits, it might be easier to achieve agreement on regulatory issues than it

has been to establish agreement on macroeconomic policies. Burns agreed that the economic summits had achieved little of lasting substance. He pointed out, however, that they were valuable for at least two reasons. First, by bringing the leaders of the major trading countries together, they helped to limit the growth of worldwide protectionism. Second, they served as a means of educating government bureaucrats about the prospects and problems of other countries. The understanding that emerges from this process is necessary for better cooperation in policy making.

ROBERT NACHMAN of the University of Pittsburgh inquired whether the research and teaching issues Professor Burns had raised with respect to the banking sector were specific to that sector or whether his call was for a more general broadening of research and teaching efforts. Burns argued strongly for the latter, noting, however, that finance provides a central linkage of economies. Other links exist as well, including trade and scientific relations. Again, understanding and international cooperation are the keys to a successful future.

JACOB COHEN of the University of Pittsburgh, called upon to summarize the discussion, noted that the explosion of debt had resulted in changes in the international economic environment. The fragility of financial markets has become a growing concern. The focus of our analysis should be on this growth of credit and on how the level of bank credit relates to economic activity. In the end we are left with the dilemma that by deregulation we have improved the microefficiency of the banking system while encouraging the growth of the volume of credit and exposing the macroeconomy to financial crises.

PART TWO

Technological Change and Its International Diffusion

Technological Change and Its International Diffusion

Lewis M. Branscomb

The Relationship of Science to Technology

The extraordinary propensity of the Western industrialized democracies for economic growth can be traced to the emergence of societies structured to facilitate and reward innovation. This came about through the delegation of economic decision-making power to individual firms, the sorting of success from failure through competition, and the development of political systems capable of absorbing the stresses brought on by change.[1] In the nineteenth century science was developing quite independently of technological innovations. Technological progress was highly empirical; technical education depended heavily on apprenticeship. These qualities set limits on the rate of diffusion of technology. A period of shared experience was necessary to transfer mastery of an industrial art.

The emergence of the corporate research laboratory in the twentieth century, reflecting growing appreciation of the potential economic importance of applied scientific research, signaled an important change in the process of technological innovation. Science provided manageable tools for achieving a desired technical solution to a problem. Technological progress could be planned, even it if could not be ensured. With strategies for achieving defined goals within available time and resources, dependence on serendipity was reduced. The power of the emerging science did not eliminate risk and uncertainty; but entrepreneurs were able, at an acceptable level of risk, to attract resources from others with which to embark on ventures with higher potential rewards, based on ever more complex technology.

It is a commonly held fallacy, however, that scientific progress leads naturally, perhaps inevitably, to technological progress. This assumption lies at the heart of the U.S. science policy of the past thirty

years, dating back to Vannevar Bush's *Science, the Endless Frontier.*[2] As Harvey Brooks points out, this paradigm still has plenty of political punch.[3]

Technological change is, of course, driven by science to a considerable degree. Given the impending world war in 1939 (the ultimate market incentive), any physicist who understood the equivalence of mass and energy and became aware of the laboratory demonstration of fission through slow neutron capture would be led immediately to the concept of a nuclear weapon. Science does call attention to, and define limits of the art of the possible.

The correct way to view the modern relationship between science and technological progress is to understand that a rich fund of scientific understanding and a wide variety of scientific tools enormously expand the possible technological responses to any problem. Thus technology increasingly avails itself of science at every step of the innovation process: conception, design, development, production engineering, production, testing, and field support. Yet, as we shall see, appropriating the economic fruits of innovation cannot be ensured with any amount of science; one must have access to a variety of complementary assets necessary for market success.[4]

The reintegration of science and engineering has a number of consequences for the process of innovation, the importance of innovation, and the geopolitical diffusion of the ability to innovate.[5] I will address these issues in due course. But first let me address the nature of innovation and the incentive structure that surrounds it.

Causes of Innovation

I will not attempt an economic theory of innovation; an extensive literature on the subject exists. For example, an excellent paper by Robert Ayres attempts to build models that will predict from economic data, market characteristics, and institutional considerations the likelihood and value of innovations.[6] I prefer to draw my understanding of innovation from experience. Let me start with an observation whose explanation may not be self-evident.

No attribute of science or of engineering says that any given artifact can be improved, in function-to-cost ratio, indefinitely at exponential rates. Yet it is remarkable how often semilog graph paper provides a useful tool for the technological futurist. For example, the cost of storing one bit of digital information on a magnetic disk storage device has decreased exponentially, by three or four orders of magnitude, in the past thirty years. Progress has been surprisingly steady, costs declining by about a factor of two every three years. The

technology introduced with the original direct-access storage device, the IBM RAMAC, was incapable of extension to the demands of performance and cost that would be needed in just a few years.[7] Yet the technology has undergone radical innovation every six or seven years and, overall has exhibited exponential progress.

Similarly, the cost per channel-mile of ground-based telecommunications has declined about 10 percent per year over a time span that saw the evolution from twisted wire pairs to coaxial cable, to microwave communications, to optical fibers.[8] Similar statements can be made about electronic logic and no doubt about many other technologies.

This steady exponential improvement of product function per unit cost over four or five generations of quite different technologies seems at variance with the well-documented notion of the product life cycle.[9] The life cycle exhibits slow improvement in early stages, followed by rapid exploitation as investment follows the early "supernormal" profits, followed by ultimate stagnation in progress as nature proves less tractable and profit margins fall from competitive pressure.

Yet stagnation would have been the fate of any of the constituent technologies had innovations not come along to allow the development to jump from one S-curve to the next, just in the nick of time, so to speak. If radical innovation can keep the pace of technological progress at near the maximum for any one technology, the innovating firm may sustain a degree of competitive advantage sufficient to justify the risks.

What drives innovation? Technical understanding that the older technology's limitations are about to jeopardize the rewards that have driven the investment strategy to that point is the motivating factor. In other words, it is the refusal of the innovators to accept reality as inevitable.

The character of this kind of innovation is well described by Charles A. Berg.[10] He and Ayres both reject the view that innovations occur in response to changing prices of factor inputs. Berg suggests that an "innovation consists of a discontinuity in the concept of production." He notes that the heart of the innovation is the novelty in solving the problem, not necessarily its economy compared with current practice. The innovator wants to get off one learning curve and onto another, even though the initial cost penalty of the jump is severe and the risk high. His eye is on the future; he wants nature on his side.

Illustrating this, one could study the Japanese approach to new product development in consumer electronics. The companies care-

fully assess the functional requirements and the permissible cost of the new product for consumer markets. Then the engineering team works on a sequence of designs, incrementally approaching the cost target, testing for consumer acceptance. The initial design will very likely incorporate highly sophisticated technical processes and materials, taken from the latest publications in science. But they will be used in an exceedingly conservative application. With this strategy the engineers work their way down a preproduction learning curve before full-scale market introduction. When the product is introduced, it already incorporates technologies with a high degree of extensibility but with little of the risk associated with pushing the limits of the technology too soon.

American engineers with the same problem would spend much more time and money pushing the technology to a design point where it is clearly superior to proven alternatives before introducing it. In all likelihood their costs would be higher. And the technology in the product, when introduced, would be more difficult to extend incrementally.

The investor who takes the risk that the innovation may fail also wants to improve his strategic position. If he is in the semiconductor industry, he can accommodate the increased labor intensity and less efficient capital use that follow from introducing new processes and new products by forward pricing. That is, he sets his prices not to recover the initial production costs but to recover total costs averaged over the life of the product. He can do this because technology learning, while never risk free, is nevertheless quite predictable.

How is it so frequently true that the needed innovation can be found in time? Science provides a very broad spectrum of choices for alternative approaches to the problem. The progress shown in engineering development—when it has access to strong science—is determined by the socioeconomic environment of the work, not by attributes inherent in that field of engineering. For example, mechanical engineers developing impact printers for computers have consistently been able to improve the throughput of printers per unit cost by about 10 percent annually; similarly educated mechanical engineers building sewing machines or dishwashers have not shown the same progress. I believe the reason lies in the great pressure on the designer of computer printers to keep their prices in line with those of the rest of the computer system, which, driven by the enormous productivity of microelectronics, tend to decrease in cost per unit function at approximately 15 percent annually. Innovation is a socioeconomic process—not an ensured attribute of the practice of engineering. Necessity is indeed the mother of invention.

The Changing Nature of Engineering

I have been describing innovation as it is encountered in technologically sophisticated industries, where firms are large enough and their profits sufficient to infuse strong science not only into research but into manufacturing as well. U.S. industry suffers a serious handicap in competition with Japanese firms because of the low prestige accorded to technical careers in production in American industry. (Chemical engineering is perhaps an exception, being the only field of engineering in which the training is specifically for production.)

Fortunately, the technical fascination of faculties and students with both robotics and computer graphics will equip a generation of students with skills specifically relevant to design for production and the production function and perhaps improve the "image" of manufacturing as a technical endeavor. The real pressure on scientific skills in production comes from the substitution of continuous process manufacturing for piece parts processing and assembly. The materials and process sophistication often requires skills at the doctorate level in the factory.

Computer technology also permits the simulation of processes and designs (provided the materials and processes are quantitatively characterized) and their qualification for manufacturability. The resulting electronic data can then be used to drive the automated, intelligent manufacturing equipment, thus integrating the functions of design and product engineering. This is the essential role for computer-aided design/computer-aided manufacturing (CAD/CAM).

When materials and processes are well understood, CAD/CAM and related technologies permit substantial acceleration of the product development and production cycle. In a technology whose productivity is improving at 10 percent or more per year, the time savings translate directly into more competitive costs. These skills are not taught in our universities—or in Japanese schools. They are practiced in Japanese industry and in many U.S. firms, but the modernization of manufacturing is moving more slowly in the United States.

Accelerated Diffusion of Technology

The increasingly well-codified scientific basis for industrial technology has two other important consequences. First, to the extent the functional and design interfaces of a component are well documented (which is necessary if designs are to be released directly to automated production and test equipment), it is easier to assemble a finished

product from parts designed and produced at different locations. Since the information transfer from design to production is electronic, these locations can also be far apart. Thus IBM commonly associates the work of a number of development laboratories in different countries to design a new computer and develop its technology and releases the design for production in plants in many parts of the world.

Under these technical circumstances it is becoming easier to provide designs for a component to a manufacturer in South Korea or Brazil that possesses an economic comparative advantage for production and to integrate that part into the whole, thereby enjoying the benefits of vertical integration. Satellite and fiber communications provide for the great expansion of low-cost, wide-band service necessary to engage economically in geographically distributed design and production.

This capability is accelerating the diffusion of technology among nations with the requisite education, management, stability, and economic policy to absorb the technology quickly. As Harvey Brooks has pointed out, in low-technology industries, there is still a lot of undocumented art in the industrial processes.[11] Art is taught by apprenticeship; therefore, it diffuses slowly. By contrast, the scientific codification of modern engineering and the detailed specifications and documentation that must accompany the use of automation and computers in design and production greatly decrease the training time needed to absorb a new technology. The extraordinary rate of technological progress in Hong Kong, Taiwan, Singapore, and especially South Korea owes much to this fact. All these countries have strong educational traditions and a strong work ethic.

Appropriating the Benefits of Science

Brooks has suggested another consequence of these trends to a global technological economy. Every country will be increasingly eager to emulate Japan and Korea, investing their scarce technical resources in applied science and in engineering, as well as drawing on the store of fundamental science provided by those countries that make the largest investments in it—most especially the United States. If the technological innovation process in high-technology industries can draw on science done elsewhere without having to practice basic research to learn its art, the nation doing the fundamental research has even more difficulty in appropriating the benefits. The net result could ultimately be a downward spiral in national investments in basic

science to the detriment of worldwide technical progress and economic growth.

Even as the president's competitiveness initiative features a doubling of fundamental research funding through the National Science Foundation, there is a growing awareness that basic science is America's strength. Our competitiveness problems lie more often in the time it takes to put new ideas into practice, in design for manufacturability, and in low-cost, high-quality manufacturing—all areas of Japanese strength. Yet the president's strategy for competitiveness seems to place heavier reliance on increasing our strengths—on which competitors also draw—than on the engineering design, production, and entrepreneurship that are required to appropriate the benefits from the nation's research.

Thus, just when a consensus is developing around a more moderate approach to technology export controls for national security reasons, economic pressures for intellectual protectionism may be growing. The Japanese Ministry for International Trade and Industry is quite concerned about this possibility.[12] Much of the pressure for a rapid expansion of basic research outside industry in Japan has its origin in U.S. representations that the imbalance in our trade with Japan and the asymmetry in access to each other's advanced research are not tolerable.[13]

Trade in Services

The opportunity to disperse manufacturing is countered by another effect of technological change. As the trend to greater automation proceeds and efficiency increasingly depends on high levels of technical education and experience, capital investment increases, and economies of scale rise in importance. This only accentuates the competitive pressures among nations to establish for their firms not only participation in the global economy but increased market shares in those segments where they may have established a comparative advantage.

A result is the evolution of a new approach to industry structure: geographically dispersed vertical integration, which requires an open system of trade policies yet strongly rewards those who can establish dominant positions. If the trend to globalization of trade stopped here, there would be stress enough on national industrial and trade policies. But these same technological trends are also giving rise to the geographical dispersion of trade in services and in intellectual property, which may be considered a kind of licensed service.

Information technology makes possible the generation of trade in services by substituting electronic communications for physical transportation. Three other driving forces are (1) access to low labor costs in a population capable of productive performance of services; (2) access to specialized skills and experience not available locally; and (3) the economies of scale that come from international aggregation of service markets. As an example of each of these we might take (1) offshore key entry of computer data; (2) acquisition of computer software from offshore programming houses; and (3) the appearance of a global capital market supported by twenty-four-hour electronic financial markets.

Indeed, technology transfer in horizontally integrated manufacturing constitutes trade in services of enormous importance, coupling service and manufacturing industries. A substantial fraction of repatriated profits from subsidiaries of transnational corporations is in the form of royalties on the technology they receive. The protection of that property becomes the critical asset preserving comparative advantage. (It is also true that repatriation of profits to multinationals in both Japan and the United States from their subsidiaries in the other country dominates trade statistics for licensed technology, reducing the usefulness of these data as indicators of relative innovative capacity.)

Thus it is no surprise that pressures are rising for the General Agreement on Tariffs and Trade to extend its rules to deal with trade in services and intellectual property. Some rapidly industrializing countries today base their growth on emulating established products by using imported technology. They need access to supporting software and services at minimum cost and tend to oppose additional safeguards for intellectual property. But those same countries are also finding computer software a cottage industry of high growth, and they may soon find themselves desiring to protect their own software and service industries.

International standardization, once regarded as an arcane matter of concern primarily to testing engineers, now emerges as a process of selection among competing, not yet established technologies. It is a selection of winners and losers in a process that tries to predict what market forces might have favored if all the alternatives could have been pursued. In consumer electronics there is likely to be only one survivor among the number of incompatible alternatives that technical innovation can produce. The trend, in Japan especially, is for the government to assemble the competitors to try to choose among the alternatives in advance, so as to crest the wave of product acceptance as rapidly as possible with a compatible system of products.

The basic factors encouraging international trade in services are the same as in manufacturing: given an educated, willing work force with traditionally lower wages but with modern telecommunications facilities, tasks that depend substantially on human mental activity can be undertaken in remote locations at lower costs. In trade in services, even more than in manufacturing, information and skill become increasingly important components of comparative advantage and therefore of value for enterprises in high-wage societies. With insufficient natural resources and very high costs for their educational and research infrastructures, highly industrialized societies feel the necessity of protecting those information assets. In contrast, newly industrializing countries will resist.

Regulation of trade in information also presents technical problems. How can a system for valuing the assets flowing across communications facilities be defined? Can any system of measurement be imagined that does not stifle the flexibility and responsiveness of the emerging global information system?

Given the increasingly important role of technology assets, of scale economies, of standards, and of human skills in the new world of trade, it is increasingly clear that old-fashioned economic theory based on approximations of "perfect" competition no longer provides an adequate guide to policy. The new international trade economics, described, for example, by Paul Krugman, calls for a much more sophisticated view by governments of their industrial policies.[14] Given the broad diversity of cultural, political, and economic traditions among trading partners, can a system of business and government practices evolve that will be acceptable to all?

Appropriating the Benefits of Innovation

I have presented arguments that the diffusion of technology is facilitated by scientific trends in engineering practice and that countries rich and poor are turning to the knowledge-intensive (high-technology) industries as a source of foreign trade to replace falling commodity revenues. But just as successful research and development do not necessarily lead to successful innovations, neither do successful innovations necessarily bring high rewards.

Many well-known innovations, such as Teflon and float glass manufacturing have indeed proved very rewarding, but many have not. Furthermore, some imitative products have been as successful as highly original ones. David J. Teece attributes the differentiating factors to what he calls "complementary assets."[15] One of the most formidable of these assets is a manufacturing system that produces a

high-quality product at the lowest costs. This has been an important competitive advantage of Japanese firms, whose products in the past have often been imitative.

Other complementary assets may include auxiliary products and services whose concurrent availability is essential to the users' satisfaction. The computer industry is highly dependent on such assets. Whatever its "power," however low its price, a computer is of little value without useful software, easily accessible training and customer support, good telecommunications services, and effective maintenance and repair services. A videocassette recorder is of little value without a source of video material at reasonable prices, close at hand. In many products the complementary assets may be culturally specific; in most cases they require a support system of people who have intimate knowledge of local markets and requirements.

The technology may be quick to learn, but these geographically sensitive associated requirements are often difficult and very time consuming to construct. Thus if a firm is entering a foreign market of an industry in which complementary assets are important, it may prefer to select imitative products that can take advantage of the assets that have already been created by the established innovators.

Teece describes IBM's success with the personal computer as a result of an excellent strategy of developing the complementary assets around a product already established by others (Commodore, Apple). Manufacturers in the Far East are now imitating the IBM personal computer with products (called "clones" in the trade press) that take advantage of the support system IBM already has in place. The next wave of success will probably go to the firm that can provide an innovative product—a break from past designs—along with the software and support that elevate utility and users' satisfaction to a new plane. The hardest part of this task will be software development and human engineering, not the invention of hardware.

As modern technology is more rapidly disseminated and modern manufacturing and design capabilities are widely distributed, more and more sophisticated products are available, at declining prices, in many countries. At the same time, it is getting more difficult to please the publics served by all this technology. Thus an increasing fraction of the innovative talent in society needs to be directed at these "software" issues.

Services, together with the products they support, will continue to be an area of growth for the most technologically sophisticated countries. Software technology, which may diffuse slowly, will limit the rewards from the rapid diffusion of hardware technology to some degree. This only reinforces the importance of international trading

arrangements that deal effectively with "soft" technologies and intellectual property.

Notes

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11. Harvey Brooks, private communication.

12. Yukio Kakita, "Summary of the Report on Technology Transfer Problems between U.S. and Japan," System Research and Development Institute of Japan, October 1986. English translation of original report in Japanese.

13. *Chronicle of Higher Education*, December 10, 1986, reporting on the Second United States–Japan Conference on High Technology and the International Environment, Kyoto, Japan, November 9–11, 1986; for more information, see office of the president, National Academy of Sciences.

14. Paul R. Krugman, ed., *Strategic Trade Policy and the New International Economics* (Cambridge, Mass.: MIT Press, 1986).

15. Teece, "Capturing Value."

Commentaries

Nam Pyo Suh

My comments on Dr. Branscomb's remarks are focused on the major issues and trends he identified. I have also added several of my own perceptions.

I agree with many of the points Dr. Branscomb made. Certainly it is true that as technologies become more rooted in science, their base becomes more quantitative and precise. With these changes, vertically integrated manufacturing technologies can become more easily dispersed globally. In this environment companies seeking to maximize their potential market share will obtain parts wherever they are manufactured most economically. They will get their engineering work from the least expensive source, regardless of geographic location. Parts may be assembled, however, in the United States, which is the actual marketplace, since assembly and customer service have joint economies.

Dr. Branscomb makes another significant contribution when he cautions that efforts to protect new knowledge could easily lead to a kind of "intellectual protectionism," which I too think should be avoided. This issue has been discussed recently in connection with defense-related research, but even in other areas a debate exists about how we might protect intellectual properties in order to penetrate foreign markets with our new knowledge. The best recourse is to use the knowledge first to develop new products and processes rather than to prevent others from acquiring it. The frontiers of knowledge can best be advanced when knowledge feeds on knowledge.

Dr. Branscomb makes an interesting point when he notes that Japanese firms tend to apply technological innovations to initially conservative applications. In my personal experience with Japanese firms I found a similar phenomenon. When we presented some advanced concepts to them, they wanted to apply those concepts to a very simple product as a means of increasing their market share. I also subscribe to the view that many innovations and inventions are

accomplished by people who are not intimidated by expanding technology.

Some may think otherwise, but I believe that innovation is needed to generate economic activity. Historically, there are many examples of this; the invention of the steam engine came before the industrial revolution. The point is that strong economic activities are *not* a prerequisite for scientific and technological progress, although they certainly help. Technological breakthroughs often establish the base for a strong economy.

The national and local environment is another major factor in innovation. Many students who are prolific producers of patentable ideas stop this sort of work when they go into teaching or other jobs in the public or the private sector. I think they would continue to be productive inventors and innovators if they were in an environment conducive to that sort of activity.

I was glad that Dr. Branscomb pointed out the fallacy of the widely held American view that scientific progress ensures technological progress. While it is widely agreed that the United States has continued to be the pacesetter for scientific progress, no one should quarrel with Dr. Branscomb's point that scientific progress is not sufficient to ensure technological leadership. We need technological, entrepreneurial, and engineering activities that can capitalize on scientific discoveries. We should also remember that technological advances lead the scientific advances in many fields. In many instances, we learned the "how to" before we understood the "why" of many phenomena and processes.

In considering the issue of international competitiveness, it is particularly important that we recognize innovative technology as being a driving force for science, as well as stimulating technological advance itself. Although the role of scientific discovery in developing new technology is well known, the role of technology in stimulating scientific inquiries is generally not well recognized. The need for mechanical power led to the invention of the steam engine, and that invention led to the establishment of the science of thermodynamics. The need to communicate over distances resulted in the invention of telephones, which led to the science of information theory.

If we are to maintain first-rate software engineering capability in the United States and to compete with other nations in manufactured goods, we must establish a science base for many of these technology-driven areas as well. Unless we can develop the science base for areas like software engineering, product design, and manufacturing, we may not be able to compete with other nations. It would involve too much labor to write the software and to develop new designs.

The United States has not been very effective in appropriating the benefits of science, a point Dr. Branscomb makes in his paper. This is a major problem for the United States, cutting across both the public and the private sectors. The time gap between research results produced in university laboratories and the practical applications of those results in our industrial laboratories is too large. Not so well known but nevertheless a part of the same problem is the time corporations need to transfer new knowledge from their research laboratories to their production divisions. We have much to do to overcome the impediments to technology transfer.

A number of suggestions have been advanced about how we can improve this situation:

- moving people between laboratories
- providing tax incentives for quickly making use of research results
- expanding support for innovative research at universities in industrially relevant areas
- redefining the mission of national laboratories
- providing added incentives for small business

Today too many of our universities neglect technology transfer and technology-related issues. Their incentive system is not conducive to promoting the transfer of technology. And they put too little effort into the transfer or transformation of research results into products and processes.

I would now like to discuss the consequences of global diffusion of technology and globally dispersed integration. This is a very important concern, one that is not specifically addressed in Professor Branscomb's paper but that we should examine in more detail. Globally dispersed integration, if not properly counterbalanced by other means or policies, may cause the loss of manufacturing jobs in the United States. As we lose our manufacturing base, many Americans will lose their ability to purchase goods. Sooner or later, many Americans believe, they will become poorer and will not be able to purchase goods made in Japan or other countries. Other nations now depend on the export of a large fraction of their manufactured goods to the United States, since it is their largest marketplace. What would happen to the free world if the United States could no longer provide such a market? No other nation is likely to fill this void.

In the final analysis, globally dispersed vertical integration might have a serious adverse economic impact on the free world. Therefore, the United States must strengthen its international competitiveness

because, unless we do so, the entire free world could be in jeopardy—not only economically but also socially and politically.

It occurred to me, as the issues were raised during the colloquium, that we may not be giving enough attention to the relationships among perceived value, innovation, and productivity. The fact that the selling price really determines productivity is well known. If you can charge more for your product because it has certain unique qualities or it will perform certain functions that no other product can duplicate, you can increase productivity. To improve productivity, one must develop value-added products that the public wants. Since perceived value is a function of technology and innovation, my opinion is that we ought to gain a better understanding of the relationship among these three things.

In summary, Dr. Branscomb provided insight into issues related to international economic interdependence. I view these issues as a benchmark for further discussions and exploration of actions needed to deal with specific problems of industrial and economic competitiveness.

William E. Souder

We are faced with the challenge of managing the seed and the soil: technology is the seed, and academia is the soil. We do a good job of germinating technology in the United States, but it does not seem to thrive. Many technologies are developed that are never used, and technology transfer problems are common. Technologies developed by one group are not picked up by another. New technologies perform well in the laboratory, only to fail in the field. America has the highest product liability rates in the world. This is a familiar litany.[1]

The Problem. We in academia are largely to blame for this sorry state of affairs. We have produced outstanding specialized scientists and engineers who create brilliant technologies. But we have not produced scientists and engineers who know how to implement those brilliant technologies.

In academia we further compound the problem by teaching "good" management theory. This theory says that efficiency is max-

imized by organizing into groups of specialized engineers and scientists, who work in isolation from those charged with the implementation of technology. As a result of our teachings, industry has specialists in developing technologies and specialists in applying those technologies—research and development departments and marketing departments, for example. This system unnaturally compartmentalizes the innovation process. Separating the development of the technology from its implementation creates serious problems of integration.[2]

The Solution. America desperately needs systems integration. We need to reintegrate the innovation process. We can achieve this through a simple philosophy: those who develop the technology are in the best position to implement it. Four steps must be taken to follow through on this philosophy:

- We must redesign our engineering and science curriculums so that no engineer or scientist can graduate without taking courses in the management of technology. Instruction and hands-on experience should be provided that teach how to interact with users, how to define market targets, how to work with users to develop product specifications, and how to develop appropriate technologies that meet those specifications.
- We in academia must solve *our own* integration problems. I happen to be a professor of industrial engineering with an undergraduate degree in chemistry who worked in industry as a chemical engineer and went on to graduate school in management. Because of that background I may be terribly confused. But I find virtually no differences in the basic logic and the problem-solving techniques used in those four disciplines. Do we really need all this specialization? Can't we integrate some of our academic disciplines better?
- We must link our science and engineering programs more effectively with the business, sociology, psychology, and liberal arts disciplines. Team-taught courses, joint student team projects, dual degrees, and joint programs are some obvious means that we have yet to use fully. I can visualize teams of undergraduate engineering students, marketing majors, and sociologists working together on international problems as a practicum or a senior thesis.
- We must learn how to teach the management of technology to the scientist or engineer as part of the engineering curriculum. Put technology management where it belongs: with the technology. Do not wait until after the engineer graduates to ask him or her to come back to the university for a master's degree in engineering manage-

ment or in business administration. Integrate the management concepts with the engineering concepts. They should go hand in hand. Let us not perpetuate the myth that creating good technologies is a specialized thing, separate from the specialty of managing that technology. *Each* science or engineering course should have, *as part of that course,* instructions *and laboratories* in the marketing, implementation, and adoption of that science or technology. This would result in a fully integrated curriculum of science and business applications, integrated *within* each course. Under this model no technical course would be given that did not integrate some marketing or management content.

This is clearly a radical proposal. Progress in implementing such ideas is always impeded by tradition, institutionalized behavior, expediency, and conventional wisdom. For instance, this proposal probably means five- or even six-year engineering degrees and the reorganization of established departmental structures. That is the price we must pay. Somehow we must overcome these hurdles. If academia cannot design new educational technologies, who else can?

Summary. I heartily agree with all Dr. Branscomb's thoughts. Technology is pushing us toward global interdependence. This creates the need for accelerated appropriation of new technologies. To achieve this, we must radically alter the way we in academia teach science and engineering. Every course should emphasize an integrated system of creating and applying technologies. Only after we have achieved this can the proper government policies and federal technology initiatives be formulated to complete the system. Those of us who manage the soil should do our part first.

Notes

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2. Souder, *Managing Innovations.*

Discussion

Branscomb's Response to Discussants

Dr. Branscomb agreed with Dr. Suh's assertion that technologies are a source of science. In fact, he had written a paper for *Physics Today* predicting that "the engineering directors of the National Science Foundation (NSF) might be charged with looking at the advanced engineering which would support some of the most ambitious scientific goals of the country." He went on to explain that while the NSF is not labeled a mission-oriented agency, it clearly has a mission: to see that the science, engineering, and technical education infrastructure of the United States is first rate.

Dr. Branscomb disagreed with Dr. Suh's statement that one consequence of global interspersed vertical integration might be the loss of manufacturing jobs in the United States. He stated that the decline in manufacturing is not always a negative proposition—it depends on the reasons for the decline. For instance, the decrease in agricultural employment created a large labor force for the manufacturing sector. Therefore, if manufacturing employment is sacrificed because productivity is high, that change may be socially desirable. If the decrease in employment is associated with low productivity, however, the country has become noncompetitive.

Dr. Branscomb called for an upheaval in engineering education as it relates to design, production, and quality: while not giving up its current scientific acumen and base, it should train students in the practice of engineering in a modern context.

Branscomb asked: "What responsibility do universities have to change the way we educate people for management of business?" He noted that business schools are largely funded by the business community, which they recreate over and over. He questioned where the external stimulation is going to come from. Whereas the engineering education system has critics in industry who try to use education as a means to transform practices in society, the business area seems to lack such critics.

General Discussion

DR. SUH stated that research in the manufacturing field should concentrate on maintaining the infrastructure that is necessary to remain competitive.

GEORGE WHITE, vice-president for applied research at the University of Pittsburgh, explained that most science and manufacturing technology had been instigated by research done by the Germans and the English. Modern advances have been based on those original inventions. Health care, however, has advanced without such standardized beginnings—it has been developed all over the world, at different paces according to each individual country's resources and needs. He questioned how, as biotechnology emerges as a central economic channel, the learning from the factory system will apply, if at all.

DR. BRANSCOMB replied that it will not be radically different. He believes that many of the issues of the relationship of science to technology to production to market entry are not fundamentally different.

MARK PERLMAN, Pittsburgh's University Professor of Economics, noted that AT&T and IBM used different techniques to protect the dimensions of their profitable markets, making penetration difficult. The protection provided a financial basis for experimentation that resulted in a number of major economic breakthroughs. He asked: "Can we look to these or other firms to maintain this flow not simply of invention but also of innovative activity? Or will we have to look abroad or wherever the conditions that should be talked about exist, namely, the protected market giving a high rate of return? The high rate of firms' savings then becomes the source of future activity."

DR. BRANSCOMB accepted Dr. Perlman's Schumpeterian proposition that protection that produces assured profits is an essential ingredient in ensuring a scientific investment to support new *technical* activity. He stated that it will not be as easy for these institutions to participate in production or process innovation. In addition, he felt that there is little worry about whether the presence of the protection lessens the incentive for innovation.

LAWRENCE C. HOWARD, former dean of Pittsburgh's Graduate School of Public and International Affairs, asked Dr. Branscomb to comment on the diffusion of innovation, its globalization, and the university's

role. Mr. Howard also asked him to define the role of computerization in assisting professors with improving their teaching and research and in their involvements with companies overseas.

DR. BRANSCOMB mentioned efficient access to data bases and the advantages of word processing as visible benefits of computerization. The most important implication of information technology is the power of peer computer networking, which will create common interests in globally dispersed institutions in the absence of any organizational structure. He felt that the newly instituted World University Network (WUN-NET) will provide an antidote to intellectual isolation.

He also noted that networks such as the European Academic Research Network (EARN) and the Because It's Time Network (BITNET) are restricted to nonprofit participants. Some government telecommunications authorities are reluctant to lease transporter lines, which allow the import and export of data without government sanction.

He allowed that "this network is destructive of national sovereignty. It is destructive of the orderly evolution of economies. It is destructive to the people who believe that national security requires the regulation of flows of information." This change is necessary, however, so that intellectuals in one country can interact with their peers in other countries, enjoying the informational benefits in both. Therefore, a change in the policies concerning protectionism and national security will have to occur.

ALEX SAVEIKIS, of Pittsburgh's School of Engineering, asked if something could be done for sections of the industry that have not been able (or have been unwilling) to advance. He used the steel industry as an example.

DR. BRANSCOMB replied that businesses have to determine what their assets are and where they have a comparative advantage. He did not know whether science and technology offered the opportunity to overcome the structural disadvantages of trying to manufacture steel in an economy such as that of the United States. If they do not, the companies have to find parts of the business that do.

DR. SUH pointed out that one cannot economically justify the investment of building modern steel mills in the United States if the cost of producing the steel here will be greater than in Japan or Korea. But domestic firms can emphasize the low-volume, highly specialized end

use part of the market, which in many cases turns out to be downstream from basic steelmaking. He suggested that a long-term solution would be to pursue radically different ways of making steel. Alternative production methods might make existing factories in other countries obsolete, giving the United States the comparative advantage.

YOTARO KOBAYASHI, president of Fuji Xerox, asked Dr. Branscomb whether he had any views concerning restrictions on technology transfer on national security grounds. Would this deny developing countries the benefit of other countries' technology?

DR. BRANSCOMB stated that most national governments attach too much importance to who owns the technology rather than to where the technology operates, whom it employs, and to which society it makes a contribution. He feels that ownership is not the principal issue. In the U.S. government opposition to the proposed merger between Fairchild and Fujitsu, politics and national strategies played a part.

PART THREE
Changes in International Marketing Techniques

Changes in International Marketing Techniques

Yotaro Kobayashi

I present three observations for consideration:

1. The major force acting on business today is the globalization of people and industry.
2. The globalization of industry is making business increasingly complex. Marketing strategy must now be based on an examination of the entire value-added chain of business, from technological development and commercialization to advertising and sales promotion.
3. Despite the increasing similarity in tastes and needs of people around the world, marketing strategies focused more finely to meet individual, local, and geographical needs and differences will play an increasingly important role in business success.

On the Trend to Globalization

The phenomenon of globalization is no more recent a trend than technological development or the progress realized in communications and transportation. Interactions among individuals and groups and the innovations made to improve the efficiency of materials and information exchange between interacting parties are, after all, the essence of human experience as dictated and driven by the fundamental requirements of existence and our inclination to be dynamic.

Today, however, the most striking aspect of globalization and the development of technology and system mechanisms is *degree*. The current level of technological sophistication, which has found application (or potential application) in almost every aspect of human activity, now allows people to engage in the exchange of materials and information with greater speed, efficiency, diversity, and *extensiveness*. Having gained the ability to interact fully throughout the globe, mankind has reached an enormously significant stage of develop-

ment. Globalization has enhanced the qualitative and quantitative degrees of entity-to-entity interaction. Of greater importance, however, is the effect that such globalization has had and continues to have on the mental perception and awareness of human beings.

In the course of a person's interaction and exchange with others, technological tools and systems (which are becoming more readily available all the time) allow the person to expand his set of transactional alternatives by providing him with information on options and opportunities that have been gleaned from environments in every corner of the globe. The global network becomes directly available to him, and the whole world suddenly seems user-friendly.

Although the current stage of globalization with all its heretofore unrevealed implications seems to be laden with potential, particularly for business, the visions for the near future will become a reality only through resolute action by corporations to extend their reach to the ultimate user through renovated—even newly created—systems and operating structures. The realization of globalization as described here will also require solutions to widespread problems of bewildering complexity. Changes in competitive environment, capabilities for competitiveness, and other economic problems are the barriers that separate the corporation from its ability to fulfill the individual's needs. For the corporation to make contact with its greatest resource, it must take on greater responsibilities, which include enhancing its ability, flexibility, and resourcefulness to eliminate meaningless barriers to meeting the needs of individuals or regional markets with distinct preferences for products and services.

In parallel with the exciting prospects for globalization are negative trends such as global trade friction, third world debt problems, a stratification of differing resources and capabilities, and antiquated systems that restrict the activity of corporations capable of doing more. With respect to friction over huge trade imbalances, particularly between Japan and other countries, two recurring themes are evident: accessibility to markets and competitiveness. Much to the frustration of many, Japan seems to have succeeded in both access to world markets and the ability to compete successfully in them. Ultimately, it appears that a thorough opening of the Japanese market may be the quickest solution to Japanese trade imbalances. By the same token, increased American competitiveness may erase some U.S. trade deficits over time. But in view of the trend of globalization as described here, "trade imbalance" may become an obsolete notion that no longer explains the reality of a global economy and market. In a form of globalization characterized by providing the individual with

an optimum choice of all available alternatives, trade friction—with all its implications—is obviously counterproductive.

As positive as the long-term outlook may be, various forms of protectionism in developed, developing, and newly industrializing countries are on the rise; they will most likely continue. Until an effective new multilateral system is in place, global resource planning strategies may be dangerous. The globalized corporation described by Peter Drucker, for one, does not seem to be a likely option now or in the near future. The multidomestic corporation as suggested by Michael Porter, however, appears to continue to be the only practical game—until the new, truly multinational trading system comes to life.

Globalization of Corporations

In his book *Triad Power,* Kenichi Ohmae expressed his concept of three major industrialized world markets—Asia/Japan, North America, and Europe. His premise is that businesses must compete equally well in each of these major markets to achieve multinational success. This includes the ability to launch a common product simultaneously around the world.

In support of this concept, most large corporations are increasing their efforts to expand from their geographic area of strength into the other major markets of the world. In fact, the business world seems to accept the hypothesis that survival itself depends on success in the "triad" markets.

Based on the international market share theory, an oversimplified view of a maximum-efficiency business is as follows:

- a central research and product development facility
- a marketing strategy that maximizes worldwide market share with a common worldwide line of products
- a very high volume, fully automated production line located in a low-cost labor market with *kan ban* (just in time) inventory control
- strong local sales organizations that follow the common marketing strategy, educating the customer to accept a worldwide product concept and thus generating a very high world market share to provide economies of scale for the highly capitalized factory

Numerous examples of this strategy are meeting great success:

- The Sony Walkman, which is virtually the same around the world, has met with tremendous success wherever it has been sold.
- Calculators, VCRs, cameras, and many other electronic devices

have achieved worldwide success with only minor modification to meet local requirements.

- One standard formula for Coca Cola has become the "pause that refreshes" around the world.
- A McDonald's hamburger looks the same and tastes the same in Milan, Tokyo, and Pittsburgh.

Despite these success stories, the changes that are occurring so rapidly in the world economy must be examined. The true needs and preferences of customers must be observed and measured in geographic terms; a reevaluation must be made of the potential opportunities available with a more geographically optimized marketing strategy versus the incremental cost of achieving the same with modern technology.

Hypothetically, a decisive cost advantage will be more difficult to obtain in the future while marketing strategy must make full use of the total value-added chain. We are thus very likely to see a resurgence of a more geographically optimized marketing strategy as a new means to achieve meaningful differentiation and competitive advantage.

Before proceeding to evaluate the opportunities in the value-added chain, it is necessary to observe some of the countervailing forces acting against the "world product" concept. First, the currency changes of the past two years have made production costs far more nearly equal in the three major markets of the world. Cost advantages through centralized production will be more difficult to obtain and may no longer be sufficient to offset the costs of shipping, duty, and freight. Second, protectionist sentiment around the world continues to emphasize local production and local value added. This will make it increasingly difficult to manufacture in one location, even if cost advantages are possible. In addition, flexible robot technology is making local production of a variety of products far more cost effective. Computer control and flexible production techniques are also making customization of so-called standard products far more feasible on a cost-effective basis. Finally, despite growing culture-to-culture understanding around the world, people continue to revere their national heritage and geographic boundaries—perhaps as a form of rebellion at being just another number in a computer.

In short, significant changes suggest the following conclusions:

- It will be increasingly difficult to achieve significant cost advantage through high-volume centralized production in any one part of the world.

- Pressure to provide jobs locally will require more business presence in each of the major markets.
- Customization of products to meet the specific needs and preferences of a local market will become easier and cheaper.
- Businesses will seek new advantages by tailoring product and marketing strategy to meet local needs.

The Xerox Corporation has a unique concept concerning the value-added chain. Technology and research are seldom considered marketing tools. At Xerox, however, it is felt that they are a strong indicator of the commitment of the corporation to the region. Research centers are located in Canada, the east and west coasts of the United States, and Japan; and a new facility has just been opened in the United Kingdom. In the product design center at Fuji Xerox's Ebina facility, design engineers work at stations linked directly with their counterparts over the Pacific in Rochester, New York, to finalize the design of several multinational products. A computer-aided design (CAD) center is also employed at various Xerox and Fuji Xerox research and development activity centers, including the software development laboratories. This strategy of international presence not only gives Xerox and Fuji Xerox a technology window around the world but also addresses the desires for full corporate participation in the regional economy. It is a definite marketing advantage in the countries where the Xerox corporations maintain laboratories.

Product planning is done primarily in the United States and Japan on the basis of a flow of customers' requirements from around the world. Product design centers are located in the United States, Japan, and the United Kingdom. Even though the market for copiers is apparently quite similar worldwide, there is much to haggle over in the attempt to develop a common product line that can meet customers' requirements in all countries. Although the European market is similar to the U.S. market, the Japanese market has some distinct differences in product needs. In some cases these differences have caused Xerox and Fuji Xerox to pursue separate geographic designs for the same relative performance product. Although this approach clearly has some cost disadvantages, it also creates savings. For example, the Fuji Xerox market requires a larger paper size than other markets to accommodate government documents. This adds some cost to the product that can be avoided if the product is designed for the minimum European and U.S. paper size requirements.

Other unique Japanese market requirements include the type and weight of the paper used, the resolution required to read kanji

characters, the allowable office power, and electrical and safety standards. Although all of these can be accommodated in a common product design, the result may be a less than optimum product for another geographic region. This situation creates a need for continual analysis and trade-off studies. Despite Xerox's best efforts to achieve a common design for all markets, it is necessary to proceed with several designs to serve the local market needs most effectively.

An example of this problem is one that is currently faced in the area of industrial design. Xerox and Fuji Xerox product planning and industrial design groups have come up with two styling concepts for an otherwise standard product. One is clearly preferred by the Japanese customers, the other apparently more desirable in the United States and Europe. Despite the wish for worldwide commonality, the value of geographical styling must be reassessed against the cost of implementation. Apparently, it is too simple to say that commonality is always the best way to go.

Manufacturing is clearly another function that is becoming a marketing tool. Despite the desire for economies of scale, it is becoming necessary to have manufacturing facilities in most major markets. Today Xerox has multiple sites in Japan and the United States, as well as plants in Brazil, Mexico, the Netherlands, France, Spain, the United Kingdom, India, Korea, Taiwan, and—soon—China. In many other countries some assembly and refurbishing work are done to provide local value added. Without this manufacturing participation, it would be extremely difficult to achieve marketing success. The result, however, is a constant balancing act to keep the factories full and efficient.

Marketing in the pure sense of the word is most definitely controlled and optimized locally.

- Product offerings may vary according to the local operating company. The Austrian company, for example, may not be able to afford to offer all the products desired by the French operating company.
- Pricing is conceptually similar around the world, but currency fluctuations have a way of making the actual results very different. Perhaps even more significant for Xerox, the combination of outright sale and lease also varies among regions.
- Sales coverage also differs significantly among operating units. Although Xerox initially developed the market through a direct sales force, changes in the economics of the business have challenged this system. Today almost all the operating companies combine direct sales with dealers, agents, and direct marketing strategies. Despite a conceptually common objective, the combination is unique to each

operating company. These variations again reflect the local market situations.

- Advertising and sales promotion are also determined by local needs. Although the theme may be similar, the message is almost always tailored to the language and culture of the regional market.

Service after sale is an extremely important part of the Xerox marketing strategy, since electrostatic copiers require significant after-sale maintenance. Although reliability has been improved over the years, service after sale is still a major concern of customers. Here again numerous trade-offs must be considered by geographical areas.

Perhaps the most generic is the design of the product. In areas of low labor cost, it is preferable to design the product so as to allow for more use of labor in repair and less parts replacement. In contrast, the more developed markets prefer more parts replacement and less human labor. Today many copier manufacturers, including Xerox, have designed their small copiers to meet the needs of the major markets by pursuing a "cartridge strategy." The cartridge contains not only the supplies but also most of the early-failure elements of the machine. When the machine runs out of toner, the customer inserts a new cartridge and at the same time replaces the early failure parts. This is, of course, a clear trade-off between cost and added convenience and reliability. It is well accepted in the major markets but may constitute a potential opportunity for trade-off in the less-developed markets in future product plans.

The other aspect of service that remains a powerful marketing tool is service response time and the customers' satisfaction with service. Although the expectations of customers vary among markets, kinds of customers, and product categories, Xerox has long understood that leadership in this area is essential to success. It is clearly another tool in formulating a geographic marketing strategy and is determined by the regional marketing unit as a trade-off against cost and other marketing considerations.

The trend of global evolution intersecting with local marketing is exemplified by the Xerox global arrangements for marketing effectiveness (GAME) strategy. As Japanese industry has become more international, many large companies have expanded their operations to the United States and Europe. As they move out of Japan, they no longer receive the special care given them by Fuji Xerox as major account customers in Japan. Hence Fuji Xerox has a new opportunity and obligation to look after its major customers, no matter where they choose to do business. Correspondingly, and in conjunction with Xerox, Fuji Xerox representatives have been sent to the United States

and Europe to act as account managers for the new overseas branches of such major Japanese customers. A Fuji Xerox representative meets with the company officials when they first start operations overseas, fills their equipment needs, explains market and product differences in the local market, and makes certain that the customer is satisfied with his after-sale service. The results thus far have been excellent.

This description of how Xerox and Fuji Xerox attempt to use the entire value-added chain to optimize geographic market participation has been presented to explain why the globalization of business does not permit the neglect of local needs and preferences. Xerox and Fuji Xerox have commonality and economies of scale as strategic goals. Yet in reality they are forced to consider many geographic factors that modify those goals. Geographical needs are increasingly important, and they more than justify the incremental costs that they impose. A continued effort for commonality will be made. Equally important, however, Xerox will be even more cognizant of the marketing opportunities inherent in identifying and serving the needs and preferences of local markets.

Conclusion

The trend to globalization is no doubt a major force behind many changes occurring in business today internationally. Numerous interactions or interdependencies among economies or disciplines on a global scale, as well as explosive progress in information, travel, and telecommunications, will make such interactions and interdependence highly sensitive and often vulnerable to changes of all sorts. They will invariably force decision makers to take a global perspective.

Yet a very important as well as sobering fact remains: human resources will continue to be the most important aspect of all economic activities. People will constitute the cardinal element in shaping the quality of information at both the sending and the receiving ends and will influence the way in which value perceptions change. They cannot become truly global, as other resources can, especially where transportability is required.

The forces of change and adjustment in the world's trade and financial arena, the protectionist movements in most major industrial regions, and the patriotic infant-economy strategies adopted by developing countries are bound to make political forces the key players in the world's economic adjustments until a new multilateral trade and financial system is installed.

Given that politicians are by nature domestically oriented and

that a considerable time characterized by some friction or political maneuvering is expected until such a new system emerges, a blind acceptance of globalism in implementing corporate strategies and actions would be most imprudent. For some time to come (say for another decade) a well thought out and clearly focused multidomestic or at best multiregional strategy will be very much in order. This is particularly true in marketing, where human perceptions and involvement are so crucial that some sort of politicization always exists, defying the application of a too simply generalized global approach.

Commentaries

C. Whan Park

Mr. Kobayashi's paper concerns an emerging globalization strategy. While recent communication and transportation technologies bring people in industry closer, this does not mean that people or industries in different nations have become increasingly similar or homogeneous. There are therefore limits to the currently accepted logic that multinational firms can gain competitive advantage by offering standardized products and marketing practices. Through closer interactions with people from different nations, we can better understand one another's operations, ways of doing things, and ways of thinking. This suggests that value-added competitive advantages based on this understanding should still be a component in business strategies for multinational corporations. Such strategies include localized product differentiation and customer-oriented marketing strategies.

Recently there has been a suggestion within the marketing profession that worldwide product standardization can lower average unit costs of marketing and production. Thus the path of future competition is laid down. Mr. Kobayashi, however, cautions against following this strategy too closely; I wholeheartedly agree with his caveat. His paper implies that we ought to understand and manage differences between countries so that the interactions between two units of business or two firms in different countries will somehow reinforce each other's strengths and compensate for each other's weaknesses.

The challenge presented is how to gain competitive advantages. The answer, on one level, is very simple: lower average unit costs and increase sales effectiveness—profit will be an automatic, logical outcome. The real problem, however, is how to bell the cat. Should we offer standardized products and follow the same marketing strategies around the world? Specifically, we need to ask, Do customers throughout the world appreciate products in the same way? Some examples, like the overseas success of McDonald's or Coca Cola, suggest that the key to a more efficient operation is to follow this kind

of standardized operation. My concern here is that this is the exception rather than the rule and that there are many more important ways to reduce cost and increase sales than by using the simple notion of economies of scale.

The central issue is how to make a better product, where "better" is determined in heterogeneous markets. I keep wondering about people from mainland China who visit this country and taste Chinese food. I imagine that they think of it as American food, not as Chinese food, because it is very different from the mainland China dishes. But this is not at all bad. Somehow we conceived the idea that Chinese food can be prepared in our way, and we have come out with some products different from the original ones. That is what I call synergy.

When chrome, nickel, and steel are combined, some entirely different creature is developed, one that is capable of withstanding the heat of jet engines. Yet none of those elements—steel, nickel, or chrome—is able to withstand the heat of the jet engine by itself. Similarly, by understanding the other's culture and way of thinking, we can come up with a better product. It is a very complicated process, but there are ways of doing it; in fact, that is what ought to be taught in the university. We should study how to understand the interactions between two disparities to produce better outcomes or products. We should teach students how to think or how to manage those interactions. That is what we at the university should address rather than trying to teach some competitive strategy that emphasizes how to beat competitors and become a winner.

Finally, there is the issue of cost minimization. There is a strong tendency to believe that product standardization is the key to becoming more efficient. Again, this belief places the focus on individual dimensions of cost rather than on the interactions among the activities that account for cost. For example, a change in a certain material from which products are constructed, say plastic instead of steel, may reduce raw material costs. The effects of this decision may extend much further, however. The change to plastic may allow increased automation of the production process, which reduces labor costs. The joint effect of automated production and the new raw material may improve the product's quality. This may reduce a host of costs associated with returns and the handling of customer complaints. With improved customer satisfaction may come more repeat business and brand loyalty, which will reduce marketing and selling expenditures.

When operating in the international marketplace, the important thing that sellers must attempt to understand is that the specific cost elements—which can be manipulated to set off the chain reaction I have just described—may vary from country to country. For instance,

some countries may require certain levels of employment for a given level of sales, which may restrict the benefits of a change in material inputs. Regardless of such variations, sellers must recognize that cost minimization is best brought about by understanding and exploiting the interactions among cost-producing activities. In short, they must identify those activities in various countries that create the chain reactions mentioned.

In summary, by properly managing the interactions among different modes of operation in different countries, I believe we will enjoy more beneficial effects on sales and costs than could be achieved by standardization of products and markets.

Toni Carbo Bearman

This international symposium provides a unique opportunity for leaders of government, industry, and academe to discuss global structural change. The focus of this section of the colloquium is on the university's role in examining international economic interdependency.

Mr. Kobayashi has presented three observations, beginning with an emphasis on globalization. In my view globalization is a result of major advances in three areas: communications, transportation, and information handling. As someone who has been in the information field for more than twenty-five years, I am particularly interested in this third area. Advances in our ability to find, create, organize, manage, disseminate, manipulate, and use information have affected all aspects of business, especially marketing and management. Marketing itself is part of the broader process of information transfer. It depends heavily on the ability to identify a customer's needs and preferences, on information about the most cost-effective way to produce products and services and deliver them in a timely way, and on efficient information delivery to promote and sell them. Marketing, to paraphrase the great Fats Waller, requires a company to "find out what he likes and how he likes it, and give it to him every day."

An effective information delivery system can *create* markets. No one "needs" Coca Cola or a "Big Mac," but clever advertising as part of effective marketing and sales programs can generate and stimulate desire. Of course, quality products, efficient service, and competitive

prices are required to produce continued sales. I agree with Dr. Park that, although some products *may* cross cultures, these are few and must be tailored to specific markets and individual needs *within* a culture.

The importance of information delivery and products and services has been discussed in both professional and popular literature. Many contend that we have become an "information society" or, as Anthony Oettinger contends, an "information-intensive society" with a large portion (often estimated as high as one-half) of the gross national product derived from information-related activities. Information is seen as a major resource, which is not consumed and may be enhanced with use. Mr. Kobayashi agrees with many others that it is a transportable resource. We all would probably agree that language, cultural interpretations and nuances, and other traits of information transfer may present barriers.

Mr. Kobayashi notes the "increasing similarity in tastes and needs of people around the world." Much of this similarity is a result of telecommunications, the beaming of television programs—American westerns or detective programs, live news coverage—into many corners of the world. It is also a result of powerful marketing and sales programs. Blue jeans, rock music, soft drinks, and other products have gained international acceptance through multimillion-dollar marketing and information programs that shape tastes and stimulate needs.

This inundation of information across national boundaries—whether from companies marketing products, television and radio stations broadcasting their programs and advertising, newspapers disseminating news and other information, or national governments disseminating scientific and technical information, policies, or political views—raises a number of major issues.

Sociocultural Issues. When a country's data reside outside its boundaries, national regulatory efforts cannot reach the data, and the absence of bilateral or multilateral agreements prevents control by the country over its own data and may limit return on demand. Such a situation could threaten national security or even national sovereignty. In many countries information products and services have been strongly nationally oriented; the diverse languages, alphabets, classification schemes, and approaches to organizing information are usually considered assets. Efforts toward uniformity of data storage or the perceived dominance by some countries may be viewed as threatening to national cultural identification and self-images.

Unrestricted data flows and the location of a nation's data outside

its borders lead many nations to fear that they may not have access to their own data when needed and that the country's cultural heritage may be in jeopardy. Related to these concerns are questions of the preservation of intellectual property rights, privacy issues, and concerns with assistance programs provided by developed countries for the less-developed nations, with their "terms of modernization." The protection of intellectual property and privacy rights has become increasingly difficult because of the ability to violate these rights offered by technology. Several ethical issues concerning the responsibilities of the information profession are being discussed at conferences of professional societies.

Political Issues. Political issues relate to equity of access, especially by developing nations; to information, disinformation, and propaganda as tools of national policy; and to national security functions. Equity of access is one of the most significant issues facing us today. One futurist has predicted a recolonization of the world based on access to information: information-poor nations will be linked with and increasingly dependent on information-rich nations.

The potential of information and communications technology to create a global communications network is being realized, but with the network comes awareness of a conflict between the information ideologies of the developed nations (often conflicting ideologies) and those of the developing nations. Many developed nations advocate unrestricted broadcast of most information across national boundaries, along with unrestricted access of a private press to all parts of the world, with uncensored reporting of whatever the private press wants to report. We have recently seen some questioning of these principles by the governments of some developed nations. Most developing nations appreciate the value of information technology yet may wish to avoid an inundation of broadcasting over which they have no control. In part, this concern derives from a feeling that reporting is biased and may reflect "developed nation imperialism." The debate between the need for a "new world information and communications order" and the need for a firm stand against control of the press is likely to continue in the near future.

National security issues have placed the United States in a bit of a quandary. Although officially we champion the unrestricted flow of most information, the government has placed restrictions on certain kinds of information, particularly technological information, identified as being of strategic importance. Senior officials of the Department of Defense may disagree with those of Commerce and State or with the academic community on this question. A related issue in-

volves the problems of encryption for secure networking, including the availability of encryption and decryption programs and setting related standards. These are just a few of the national and international policy issues in need of resolution.

The trend to globalization intensifies the importance of these issues and emphasizes the need to prevent a widening of the gap between developed and less-developed nations. The global network Mr. Kobayashi describes is rapidly approaching, but many people, particularly those in less-developed nations, may not see "the whole world" as "user-friendly."

The implications are numerous. For instance, we can anticipate that all organizations will come to rely more on information, placing greater demands on information delivery systems and greater importance on the skills of finding and using information effectively. Programs like Pittsburgh's new interdisciplinary telecommunications program, the university's movement into the medical informatics area, and its work on artificial intelligence and expert systems will achieve even greater importance, and curriculum revisions will be needed in these areas.

These implications are ethical as well as practical. Information has always been power; with improved information systems, the possibilities of trading on inside information, violating privacy and proprietary rights, and creating markets for products that may not benefit society (promoting the use of baby formula in underdeveloped areas, for example), can mean even greater power. Our curriculums need to incorporate discussion of ethical issues, so that graduates of our programs understand the ethical implications of their actions for society and its benefit, as well as how to be successful.

A third major implication is an emphasis on the need for standards. Mr. Kobayashi mentioned differences in paper size. We are all familiar with the traveler's problems with electric current and outlets. Globalization will require international standards for sharing data, computer protocols, manuscript formats, and many other related applications. Concerted and cooperative international efforts will be needed to make standardization a means to an end, not an end in itself.

Discussion

Kobayashi's Response to Park

Mr. Kobayashi expressed concern about the optimistic view in management, particularly in marketing, about "globalism." As an example he cited Peter Drucker's view that the truly global corporation looks at the world as a single global unit in which the corporation draws upon reserves, produces, and sells anywhere without respect to national location. Drucker also advises, however, that a number of international corporations are largely domestic. Mr. Kobayashi felt that this is the actual situation.

He agreed with Dr. Park that there are two reasons why it will be quite some time before we know "truly global corporations will be a reality." The first is that globalism is based on the idea that the major resources of a corporation are transportable or interchangeable. While Mr. Kobayashi agreed that this is valid for money, he doubted that people, because they "are the sources and recipients of perceived values," are similarly transportable.

The second reason is that the current political and social environment, with the menacing trend of increasing protectionism in developed and developing countries, favors infrastructural and industrial strategies. Until a new system becomes effective, which will be at least five to ten years, political factors will prevent corporations from acting in a truly global manner.

For these reasons, in addition to the domestic orientation of politicians, it would be dangerous for corporations to strive to become global; they should work instead toward becoming multidomestic or multiregional. He argued that corporations should aim toward customization rather than standardization.

Mr. Kobayashi identified the key issue in marketing as efficiency versus effectiveness. Efficiency focuses just on production and distribution costs; effectiveness includes a sales dimension. He concluded that although in the long term efficiency is needed, it is mainly a complement to the degree of effectiveness. Standardization does contribute to efficiency, but "if you want to be a winner, you have to

be effective. A corporation just cannot be effective continually by going after the standardization strategy."

Kobayashi's Response to Bearman

Mr. Kobayashi stated that "our business is to make the society as information intensive as is appropriate" but observed that certain issues arise particularly with respect to developing countries' access to the "so-called information society." Installation of information equipment and training of technical personnel are clearly feasible, but, information management is a more difficult skill to master. How information should be handled depends on the maturity of the people managing it, their education, the degree of regulation of the press, and similar elements. It is important to take care to avoid creating overglorified expectations.

As an example of poor information management, Mr. Kobayashi referred to developing countries that try to leapfrog the development of manufacturing industry and go straight to the service or high-technology industries, which are beyond their economic capabilities. The manufacturing industry then stagnates because of politics and poor management of information.

He also pointed out that accessibility of information would benefit the consumer but might shorten product life and blur the distinction of any particular "commodity." Such factors will inevitably increase pressure on the ability of the firm to compete by increasing product development.

Mr. Kobayashi went on to indicate the importance and delicacy of ethical issues. He stressed the desirability of universities' accommodating the study of ethical issues to the extent that such things can be taught.

On the subject of standardization, Mr. Kobayashi asserted that some practices still prohibit the standardization of many products, even within Japan and other countries. He stated that "we have not done enough in making our standards more universal. But I think that the trend is there; particularly when we talk about information and the interactive interfacing ability and capability that is so needed in the networking systems. International standardization is absolutely necessary."

General Discussion

JAGDISH BHAGWATI, of Columbia University, pointed out the tensions that advanced technology carries with it. The high cost of purchasing

the systems and of training people to use them puts such technology beyond the means of many developing countries. In addition, the equipment is continually being updated and thereby increasing in cost. Professor Bhagwati also noted that because of the expense, this technology would be available only to a small proportion of the population of developing countries.

TONI CARBO BEARMAN stated that in addition to the costs, there are three other prohibitive factors. The first is the physical aspect; for instance, erratic power supplies can wreak havoc with any computerized system. The second is the time and expense of education in technology and information management. The third is access to the documents and information. Dean Bearman suggested that research should be done to make materials universally available.

Someone asked Mr. Kobayashi whether he thought that the information lag in China was serious and whether China could get past some critical point to a position where they would get positive economic returns in the international economy.

MR. KOBAYASHI replied that although the country is in the process of setting priorities (which he felt is essential), China is far from becoming a very important market. He also believed that because of its enormous population, it is only a matter of time until China has a healthy, effective information society.

DR. BRANSCOMB wondered whether Mr. Kobayashi believed that a worldwide management culture can be valuable to an enterprise, allowing it to respond to changing economic circumstances around the world. He pointed out that such management might be able to insulate its judgment from local political and cultural attitudes. If this were true, it might be the validation needed to turn the nationally based multinationals into true multinational entities. Most are now managed by the citizens of the country of ownership or origin.

MR. KOBAYASHI replied that he indeed thought worldwide management culture was valuable to corporations and that it would change a small number of them into true multinationals. He cited IBM as one of the few corporations that might fall into that category. It has already gone beyond manufacturing products to suit American specifications or those of any one country and has come to the point of offering an almost truly universal product. Very few firms will be able to do this,

although some will try to copy what IBM has done, even though such imitation may be beyond their capabilities.

Someone in the audience brought up the issue of management's willingness to undertake the globalization of a corporation or product. Several questions were posed: Are the technological, marketing, or managerial limitations holding them back? Do corporations really plan globally? Or do they merely follow the lead of a corporation like IBM?

MR. KOBAYASHI responded by saying that he felt it was a combination of both: the basic characteristics of IBM's globalization efforts should be changed incrementally according to the individual company's needs.

DR. PERLMAN wanted Mr. Kobayashi to explain how one enters a market: "Is it a problem of the marketing department, or is it a separate problem?"

MR. KOBAYASHI, using Brazil and Korea as examples, demonstrated how decisions on whether to enter a market are made. It would depend on some marketing research but mostly on the corporation's perception of what that country or market offers in the way of benefits and restrictions.

ROBERT NACHMAN wanted to know if developing countries could look to the more developed countries as their external markets.

MR. KOBAYASHI stated that he thought this was quite possible and, in fact, was already taking place. Products or components made much more economically in China or Japan, for example, can be exported to the United States or other countries. He felt that other developing countries might be involved in such an exchange.

DR. BRANSCOMB explained that many countries, because of the collapse of worldwide commodity prices, have faced the necessity of finding some other element of the economy to encourage for export potential. He used Australia's software boom as an example.

DR. PARK brought up the subject of the university's curriculum—specifically how to handle the issues of globalization versus customization in Pittsburgh's School of Business. No one, he said, is

helping the students develop the perspective of so-called symbiotic relationships, whereby a firm's weakness can be strengthened through working with other firms overseas. He noted that misunderstanding and language deficiency cause barriers to the interactions that are the basis for symbiotic relationships.

PART FOUR

Global Interdependence and International Migration

Global Interdependence and International Migration

Jagdish Bhagwati

Interdependence in the world economy is manifest to all in the areas of international trade and finance.[1] The world economy is indeed characterized by a growing integration of markets for commodities, services, and capital.

This integration reflects the inevitable interaction between market forces and governmental policies and designs. But, broadly speaking, we can distinguish two stylized scenarios: in one the governmental designs, reflected in the creation of an international infrastructure, have envisaged and stimulated the pursuit of policies that have produced the integration; in the other the process has been reversed. The phenomenal trade expansion of the postwar period is an excellent example of the former process; the unprecedented and unforeseen expansion of the private international financial markets fits the latter mold equally well.[2]

In the former case, the process was sanctioned by the international infrastucture provided by the Bretton Woods architects. The General Agreement on Tariffs and Trade (GATT) provided the umbrella under which their liberal vision of an expanding, open-trading world economy would be pursued.[3] The International Monetary Fund (IMF) was equally charged with, and played a role in, creating and maintaining the international monetary order that permitted the unprecedented trade and expansion to take place. This Bretton Woods infrastructure thus provided the mechanics for taking major

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strides toward a liberal international economic order, which would witness a rapid expansion of the world economy.[4]

In the latter case, however, where governments have largely followed the market forces, the design of international institutions or conventions has naturally lagged behind the market phenomena. This is true, for instance, of efforts at devising multinational codes for transnational corporations and of the growth of the Group of Five (G-5) countries and other intergovernmental groups seeking to manage, by international coordination, the economic consequences to each of a world economy characterized by increased interdependence in capital and trade flows.

International migration, defined broadly as transnational flows of people (whether "permanent" or "temporary" and no matter how motivated), falls naturally into the category where policies have followed rather than led, the flows reflecting underlying economic and political forces.

Thus it is noteworthy that the Bretton Woods infrastructure simply did not address questions pertaining to international migration: no institutions, no codes were considered. No such infrastructure blessed the growth of international migration, nor did it seek to define the economic and social principles that should govern the process.

Rather, such conventions and institutions have emerged with a deliberate lack of speed in response to migrations that occurred willy-nilly and in substantial magnitudes in the postwar world. Thus significant refugee and illegal migrations have occurred around the world, crisscrossing poor and rich nations in a complex maze, reflecting largely political upheavals and market forces, respectively. Again, underlying economic needs of the rich countries led until the 1970s to sizable legal inflows of *Gastarbeiter* and other workers into Western Europe, and during the 1970s into the member countries of the Organization of Petroleum Exporting Countries (OPEC), under strictly defined immigration policies.

Overlying the process has been the fact that the magnitude and composition of international migration have been largely governed by *autonomy of action* by the receiving countries. This reflects the fact that the economist's traditional use of the utilitarian criterion to arrive at the liberal world order—where goods and capital flow freely (with exceptions that define suitably devised interventions by benign and omnipotent governments)—does not extend to flows of people across national borders. When international migration is discussed, the philosophical criterion used to judge policies shifts inevitably to "communitarian" ideas, such as those propounded by the philosopher Michael Walzer, which legitimate the "right to exclude."[5] Revealed

criteria also suggest that theories of natural rights whereby men and women may locate where they wish—theories that were fashionable in sixteenth-century Spain when the conquest of the Americas was thus legitimated and the freedom of location meant in effect the right to gain, not give, entry—are not popular.[6] Restrictions on exit are regarded as reprehensible, but symmetrical restrictions on entry are considered far less distasteful, if at all.

International migration flows therefore closely reflect deliberate policy choices by the countries of destination, though less so for refugee and illegal migrations. Unlike models of internal migration, where supply and demand (or "pull" and "push") factors play unhampered on the economic stage, analyses of international migration must therefore put the destination country's immigration control policies firmly at center stage.[7]

We will do well to remember these important asymmetries of analysis that must necessarily characterize the study of international migration. This is particularly so for the study of skilled migration, which Mark Perlman has suggested as the special focus of the present paper. Its magnitude, its composition by occupation and by source, and related issues are questions that cannot be answered except by reference to the interaction between market forces and the structure of immigration country objectives as embodied in their immigration legislation.

The paper is divided into four further sections. The first puts the phenomenon of skilled migration, popularly described as the "brain drain," in the perspective of different kinds of postwar flows of people among broad groups of countries: the rich, the poor, and the centrally planned economies. The second section focuses on the skilled flows, with primary emphasis on U.S. experience. The next section raises several policy issues, and the final section briefly suggests areas for further academic research, in light of the foregoing analysis.

Patterns of Postwar International Migration Flows

The postwar patterns of international migration flows can be broadly portrayed. Note at the outset, however, that "migration," though popularly thought of as a permanent shift of people across national boundaries, is no longer treated as such in the scientific discussions, simply because it is evident that people often go back and forth, that over a life span even apparently permanent migrants occasionally return to their source countries in retirement, and that the legal and statistical classifications that divide incoming aliens into temporary

and permanent migrants on the basis of types of visas or declared intentions have little value for economic analysis.[8]

Nonetheless, such data as are available have been classified in precisely this way. Thus the most-quoted statistics relate to gross, permanent, legal immigrants as defined by the immigration legislation and practices of the major traditional countries of destination for European emigrants: the United States, Canada, Australia, and New Zealand.

Such legal, permanent immigrants have remained the major source of international migratory flows in the postwar world economy. The United States is estimated to have received nearly 8 million such immigrants between 1960 and 1980, amounting to an estimated share in U.S. population growth of over 16 percent. During the same period Australia, Canada, and New Zealand took in roughly 5.7 million.[9] All in all, the gross legal permanent immigration during this period may well have been in the range of 15 to 17 million in the world economy.

Was it unprecedentedly huge? It probably was not. The historical data in table 1 show that in the nineteenth century, right up to the first enactment of national legislation on immigration in 1921, the average rates of immigration per 1,000 U.S. population were three to five times those since the 1950s. Table 2 suggests the same historical conclusion about shares of immigration in population growth for the United States and Canada in particular. Table 3 suggests the same from the opposite end, looking at the share of emigrants in the population of the countries of emigration. What are different today, however, are the enormous growth in the postwar world economy of temporary foreign worker programs (estimated to have reached as many as 13 to 15 million by 1980), the accelerated refugee movements in Asia, Africa, and Central America, and the growth of substantial illegal immigration into Europe and more dramatically into the United States.

Although these distinctions are relevant, table 4 presents a taxonomy that builds on two other functional distinctions with policy relevance: (1) dividing source and destination countries into poor, rich, and centrally planned economies; and (2) breaking the flows into two main categories: unskilled and skilled.[10] The major categories of postwar flows (illegal migration, refugee movements, worker programs, legal migration, and movements related to multinationals and technical assistance) are set out. The data in the field of international migration are notoriously beset by conceptual difficulties and paucity. Therefore, much of the discussion below is necessarily qualitative, while indicating broad orders of quantitative significance where possible.

TABLE 1

U.S. IMMIGRATION, 1820–1984

(thousands)

	Total			Total	
	Number	Rate[a]		Number	Rate[a]
1820–1984	51,950	3.4	1965	297	1.5
			1966	323	1.6
1820–1830[b]	152	1.2	1967	362	1.8
1831–1840[c]	599	3.9	1968	454	2.3
1841–1850[d]	1,713	8.4	1969	359	1.8
1851–1860[d]	2,598	9.3	1970	373	1.8
1861–1870[e]	2,315	6.4	1971	370	1.8
1871–1880	2,812	6.2	1972	385	1.8
1881–1890	5,247	9.2	1973	400	1.9
1891–1900	3,688	5.3	1974	395	1.9
1901–1910	8,795	10.4	1975	386	1.8
1911–1920	5,736	5.7	1976	399	1.9
1921–1930	4,107	3.5	1977	462	2.1
1931–1940	528	0.4	1978	601	2.8
1941–1950	1,035	0.7	1979	460	2.1
1951–1960	2,515	1.5	1980	531	2.3
1961–1970	3,322	1.7	1981	597	2.6
1971–1980[f]	4,493	2.1	1982	594	2.6
1981–1984	2,294	2.5	1983	560	2.4
			1984	544	2.3

NOTE: Through 1976 for years ending June 30, except as noted; beginning 1977 years ending September 30. For definition of immigrants, see text. For 1820–1867 alien passengers arriving; for 1868–1891 and 1895–1897 immigrants arriving; for 1892–1894 and 1898 to the present, immigrants admitted. Rates based on Bureau of the Census estimates of resident population on July 1 through 1929 and of total population thereafter (excluding Alaska and Hawaii before 1959). See also *Historial Statistics, Colonial Times to 1970*, series C 89.

a. Annual rate per 1,000 U.S. population; ten-year rate computed by dividing sum of annual immigration totals by sum of annual U.S. population totals for same ten years.

b. October 1, 1819–September 30, 1830.

c. October 1, 1830–December 31, 1840.

d. Calendar years.

e. January 1, 1861–June 30, 1870.

f. Includes transition quarter, July 1 to September 30, 1976.

SOURCE: U.S. Immigration and Naturalization Service, *Statistical Yearbook*, annual; and releases.

TABLE 2

GROSS PERMANENT IMMIGRATION AS A PERCENTAGE OF TOTAL POPULATION GROWTH, 1851–1980

	United States	*Canada*	*Australia and New Zealand*	*Latin America*
1851–1880	29.3	42.4	20.0	9.3
1881–1910	43.1	106.3[a]	80.7	22.1
1911–1940	23.4	59.6	52.4	10.9
1941–1960	8.0	36.2	58.0[b]	3.2[b]
1961–1980	16.6	47.1	56.5	n.a.

n.a. = not available.
a. Population growth less than immigration because of out-migration.
b. Immigration from Europe only, 1946–1955.
SOURCE: Swamy, *Population and International Migration*, table 1.

TABLE 3

PERMANENT EMIGRATION AS A PERCENTAGE OF INCREASE IN POPULATION OF EMIGRANTS' COUNTRIES, 1851–1980

	Europe	*Asia*[a]	*Africa*[a]	*Latin America*
1851–1880	11.7	0.4	0.01	0.3
1881–1910	19.5	0.3	0.04	0.9
1911–1940	1.4	0.1	0.03	1.8
1940–1960	2.7[b]	0.1	0.01	1.0
1960–1970	5.2	0.2	0.10	1.9
1970–1980	4.0	0.5	0.30	2.5

NOTE: Numbers are calculated from data on gross immigration in Australia, Canada, New Zealand, and the United States.
a. The periods from 1850 to 1960 pertain to emigration only to the United States.
b. Emigration only to the United States.
SOURCE: Swamy, *Population and International Migration*, table 2.

From Poor to Poor Countries. At first blush, it would appear that the flows between poor countries must be confined to the unskilled and skilled refugee migrations that unfortunately crowd the television screens. Indeed, such movements have constituted an increasing fraction of total refugee flows (which appear to have been primarily European in origin during the 1940s and 1950s). Domestic upheavals and military conflicts have produced refugees in millions, fleeing, for instance, from East Pakistan into India, from Ethiopia into Somalia

(over 1 million in 1980), from southern Sudan into Ethiopia, from Ruanda and Zaire into Uganda, from Uganda into Sudan and Zaire, from Burundi into Tanzania, from Equatorial Guinea into Gabon and Cameroon, from Angola and Zimbabwe into Botswana, and from Chad into Nigeria.[11] Refugees have simply fled to the first safe haven that crossing the border offered.

At the same time, however, there have been some nonrefugee flows of unskilled migrant workers between the poor countries. Such "economic" migration is usually from the poorer to the more prosperous of the poor nations. Argentina, for example, has traditionally attracted migrants from other countries of the southern cone; Venezuela has received migrants from Colombia and Ecuador; and Singapore has attracted workers from Malaysia, Thailand, Sri Lanka, and Indonesia.[12] In Africa the more prosperous and well-managed Ivory Coast has attracted migrants; so have Ghana, Senegal, and Gambia in a lesser degree.[13]

Some of this migration reflects traditional migratory patterns among tribes cutting across modern postcolonial nation-states, resulting in informal, often uncontrolled, and even illegal modern migrations. Some of it also reflects new economic realities making temporary recruitment of workers a mutual-gain transaction between the governments of the sending and receiving countries, as when Cameroon signed a bilateral agreement with Gabon in 1977 for the export of workers and Equatorial Guinea contracted for workers with the Nigerian government.

Much of this nonrefugee migration has been unskilled. But skilled migration has also occurred, chiefly through the activities of multinationals, which, whether they are of poor country or rich country origin, increasingly recruit nationals of developing countries for posting in other developing countries, and also through the many technical assistance programs of developing countries and of international agencies, which do likewise.

From Poor to Rich Countries. The most dramatic flows of people in the postwar period have occurred in the *Gastarbeiter* programs of Western Europe until the mid-1970s and the imported worker programs of the OPEC countries of the Middle East during the 1970s.

West European countries drew on *Gastarbeiter* until the mid-1970s when, faced with the OPEC-induced recession, they began to draw back from these programs.[14] The workers were drawn from poorer neighboring countries such as Greece, Italy, Portugal, Turkey, Spain, and Yugoslavia. The numbers involved were substantial. The estimated number of migrant workers in the important West European

TABLE 4

PATTERNS OF POSTWAR INTERNATIONAL MIGRATION FLOWS

Origin	*Destination*		
	Poor countries	Rich countries[a]	Centrally planned economies
Poor countries	Unskilled • Some refugee migration (e.g., Guatemala to Mexico) • Several others, legal and illegal (e.g., Bangladesh to India, Ghana to Nigeria)	Unskilled • *Gastarbeiter* programs of European countries • OPEC[b] area inflows • U.S. temporary worker programs • Illegal immigration • Legal immigration • Refugees	Rare
	Skilled • Some refugee migration • Intergovernmental and international technical assistance programs (e.g., India to Nepal)	Skilled • Brain drain to United States and OECD[b] countries • OPEC[b] area inflows • Refugees	
Rich countries	Unskilled • Rare	Unskilled • *Gastarbeiter* programs (Italy, Spain, Greece, to richer Western Europe)	Rare
	Skilled • Technical assistance programs	Skilled • Brain drain from Europe to North	

	• MNC[b]-related outflows	America; some reverse flows • MNC[b]-related flows	
Centrally planned economies	Refugee outflows (e.g., Cambodia and Vietnam to Thailand, Malaysia, and Indonesia) Technical assistance programs	Refugee outflows (e.g., Soviet Union to United States)	Some (e.g., Vietnamese workers in Soviet Union; imported workers in East Germany)

NOTE: Only predominant patterns are listed. The entries are not exhaustive.
a. Including OPEC countries of the Middle East.
b. OPEC = Organization of Petroleum Exporting Countries; OECD = Organization for Economic Cooperation and Development; MNC = multinational corporations.

countries was 6.3 million in 1975 and roughly the same in 1980, having risen steadily through the 1960s (table 5).[15] The total increment in the work force in the countries of destination was significant as well: by 1974 the imported workers were as much as 18 percent of the work force in Switzerland and 8 percent in Belgium, France, and Germany.[16] For Western Europe as a whole, the 6.3 million constituted nearly 15 percent of the work force. Similarly, the workers abroad were often a sizable fraction of their own countries' work forces. The best estimates available show these fractions for the sending countries for the European *Gastarbeiter* system as high as 11 percent for Portugal and 4–5 percent for Turkey and Greece (table 6).

The importation of workers from the poor nations also increased dramatically in the OPEC region, just as the European *Gastarbeiter* program went into a virtual freeze, both phenomena being the opposed outcomes (for oil producers and consumers) of the same phenomenon of a sevenfold increase in the price of oil. Table 6 shows for some major source countries of manpower in this region, such as Egypt, the Yemen Arab Republic, the People's Democratic Republic of Yemen, and Jordan, legal emigrant workers as percentages of their total work force at dramatically high levels, ranging from 9 percent to 40 percent in the middle and late 1970s. For the sparsely populated receiving countries too, the proportion of migrant workers to the indigenous work force has been very high. In Kuwait, Libya, Saudi Arabia, Oman, Qatar, and the United Arab Emirates, the imported workers from the Arab states and from Pakistan, Korea, Turkey, India, and Bangladesh have amounted to as much as 34 percent for Saudi Arabia and 85 percent for the United Arab Emirates in 1975.[17]

The import of "temporary" workers has also been undertaken by the United States, principally from the West Indies and Mexico, earlier under the bracero program and later under specific programs for that purpose, including the 1986 legislation.[18]

The number of "temporary" migrant workers in the world economy may well have been in the range of 13–15 million in 1980, including over 6 million *Gastarbeiter* in Europe, nearly 3 million foreign workers in the Middle East, and the imported workers in South America and Africa.

None of these reflect the increasing flows of illegal immigrants. While the problem is by no means insignificant in Europe (and for migrations from poor to poor nations in Africa and South America), the most striking illegal flow from the poor to the rich nations has been on the Mexico–United States border, with estimates ranging from 2 to 10 million by the early 1980s. The policy responses of

TABLE 5

RECORDED NUMBER OF MIGRANT WORKERS, SELECTED WESTERN EUROPEAN COUNTRIES, 1980, AND TOTALS FROM THE 1960S

(thousands)

Country of Origin	*Austria*	*Belgium*	*France*[a]	*West Germany*	*Luxembourg*	*Netherlands*	*Sweden*	*Switzerland*	*United Kingdom*[b]	*Total*
Algeria	—	3.2	322.7	1.6	—	—	—	—	—	327.5
Finland	—	—	—	3.7	—	—	108.0	—	1.0	112.7
France	—	38.5	—	54.0	8.5	2.0	—	—	14.0	117.0
Greece	—	10.8	3.0	138.4	—	1.2	7.5	—	6.0	166.9
Italy	—	90.5	146.4	324.3	11.2	12.0	—	301.0	73.0	958.4
Morocco	—	37.3	116.1	16.6	—	33.7	—	—	—	203.7
Portugal	—	6.3	430.6	59.9	13.7	4.2	—	—	5.0	519.7
Spain	—	32.0	157.7	89.3	2.3	10.4	—	85.7	17.0	394.4
Tunisia	—	4.7	65.3	—	—	1.1	—	—	—	71.1
Turkey	28.2	23.0	20.6	623.9	—	53.2	—	20.1	4.0	773.0
Yugoslavia	115.2	3.1	32.2	367.0	0.6	6.6	24.0	62.5	5.0	616.2
Other	31.3	83.2	192.4	490.1	15.6	73.2	94.6	237.0	804.0	2,021.4
Total 1980	174.7	332.6	1,487.0	2,168.8	51.9	197.6	234.1	706.3	929.0	6,282.0
Total 1975	195.8	316.8	1,584.3	2,204.7	46.8	187.0	204.0	753.7	863.3	6,309.6
Total 1970	148.0	217.0	1,300.0	1,800.0	—	190.0	218.0	829.0	700.0	5,402.0
Total 1960	6.0	138.0	975.0	279.0	—	57.0	122.0	515.0	451.0	2,543.0

—No migrants recorded or estimated, magnitude less than 500, or not applicable.

a. *Enquête sur l'emploi*, which provides an underestimate by several 100,000 because small-scale employers, home-based workers, and workers living at construction sites are not or are insufficiently covered.

b. May–June 1979, estimate by the Department of Labour on the basis of the 1979 Labour Force Survey.

SOURCE: W. R. Böhning, *Studies in International Labour Migration* (London: Macmillan, 1984), p. 19.

TABLE 6

LEGAL EMIGRANT LABOR AS A PERCENTAGE OF THE LABOR FORCE IN THE EMIGRANT COUNTRY, 1975–1981

Country	*Year*	*Percentage of Labor Force*
Bangladesh	1979–1980	a
India	1980	a
Pakistan	1979–1980	6.0
Egypt	1980	9.0
People's Democratic Republic of Yemen	1980	34.0
Yemen Arab Republic	1981	39.0
Sudan	1975	a
Syria	1975	2.0[b]
Tunisia	1975	2.0[b]
Jordan	1975	40.2[b]
Botswana	1979	8.0
Lesotho	1978	40.0
Greece	1980	4.5
Italy	1980	4.0
Portugal	1980	11.0
Spain	1980	2.5
Turkey	1980	4.5
Yugoslavia	1980	6.0

NOTE: Data on migrant workers are not very accurate—the table provides only approximate values.

a. Less than 1 percent of employed labor force.

b. Percentage of employed labor force.

SOURCES: Bangladesh: Ashraf Ali Syed, *Labor Migration from Bangladesh to the Middle East*, World Bank Staff Working Paper no. 454 (Washington, D.C.: World Bank, 1981). India and Egypt: author's estimates. Pakistan: Ijaz Gilani and Fatheen Kahn, "Labour Migration from Pakistan to the Middle East and Its Impact on the Domestic Economy," *Journal of Pakistan Institute of Development Economics*, Research Report Series, nos. 126, 127, 128 (June, July 1981), table 6. Jordan, Syria, Sudan, Tunisia: Ismail Serageldin, *Manpower and International Labor Migration in the Middle East and North Africa* (New York: Oxford University Press, 1983), table 8.2. Botswana: National Migration Study, *Migration for Botswana: Patterns, Causes, and Consequences* (Gaborone: Central Statistics Office, Ministry of Finance and Development Planning, 1982), vol. 1, p. 30. Lesotho: World Bank and United Nations Development Program, *Balance of Payments: Lesotho* (1981), app. A. Southern Europe and Turkey: Organization for Economic Cooperation and Development, *Southern Europe and Turkey: Survey* (Paris: OECD, 1981). Swamy, *Population and International Migration*, table 3.

countries faced with illegal inflows have varied from drastic and summary expulsions to humane grants of amnesty.[19]

Refugee flows from the poor to the rich countries are also a common and increasing feature of the world economy. Flows from Haiti, Afghanistan, and Central America to the United States and from Sri Lanka to West Germany, Switzerland, and Canada are among the most familiar illustrations of a trend that has put an increasing strain on the willingness of the countries of destination to grant asylum and immigration status to the refugees.[20] It has thus created pressures to insist on the strictest interpretation of the tortuous distinction between "economic" and "political" refugees: the former being not entitled to asylum or immigration, the latter being true refugees.[21]

Legal permanent immigration from the poor into the rich countries has been a major component of unskilled flows as well. Much of this influx reflects the "familial," as against "economic," criteria by which immigration control systems such as that of the United States are operated, eschewing strictly economic selection criteria. A respectable component of migration from poor to rich nations is in fact *skilled migration*. This phenomenon has been sharply accentuated in the United States since the 1965 Immigration Act, which eliminated country-specific preferences and made it possible for professionals of all countries to compete on an equal basis for access to U.S. immigration quotas. The next two sections of this paper are wholly devoted to a discussion of this kind of migration.

While this brain drain, or what some call the perverse or "reverse transfer of (embodied) technology," tends to be more permanent when professionals move from poor to rich nations, because of the migrants' own aspirations and the readier willingness of the destination countries to accept skilled professionals as members of society, the flow to the OPEC countries has been essentially temporary. They have sought to prevent permanent settlement, fearing alien influence, and have even sought to isolate the aliens from the host country populations. Equally, professionals view their migration to the Middle East as a means of quick and substantial financial gain rather than as a permanent shift of their location, unlike a move to the more open, advanced, and pluralistic societies of the West.

From Rich to Poor Countries. Migratory flow from rich to poor countries is like taking water uphill. It has to be random rather than systematic. It occurs predominantly only as part of government technical assistance programs or the influx of personnel in subsidiaries of multinational corporations to the poor countries.

From Rich to Rich Countries. The *Gastarbeiter* programs in Western Europe drew extensively on poorer European countries such as Greece, Italy, and Spain for unskilled workers, but major flows of skilled migration have also occurred among the rich countries. In fact, the phrase "brain drain" came into vogue to describe the loss to the United States of European scientists in the 1960s, not the later emergence of this phenomenon from the underdeveloped countries to the United States, Canada, and Europe. The brain drain between rich countries soon ceased to be a source of worry and discord, as many European scientists returned home when the demands of the U.S. space programs reached a plateau in the 1970s and as the U.S. immigration system shifted in 1965 to accommodate an increasing fraction of professionals from non-European, underdeveloped countries.

From Centrally Planned Economies to Poor Countries. The centrally planned economies have generally had negligible illegal or legal outflows of their populations to the outside world. Their willingness and ability to adopt draconian border regulation measures appear to preclude significant mobility.

The outflow of refugees has been much larger, however, from the Asian than from the European centrally planned economies. Boat refugees from Vietnam and refugees pouring out of Cambodia and Laos have reached dramatic numbers. By 1980 over 800,000 refugees from Cambodia were in Thai and other frontier camps. Laos also generated over 250,000 refugees between 1975 and 1978. over 250,000 North Vietnamese of Chinese ethnicity fled to China in the late 1970s.

From Centrally Planned Economies to Rich Countries. The classic outflow of refugees here has been from Hungary, Czechoslovakia, and Poland to Europe and to the United States after their aborted uprisings. The Soviet emigration, largely of Jewish refugees, has been more heavily directed to the United States, the magnitudes varying with the state of U.S.-Soviet relations. The boat refugees from Vietnam have also been relocated in significant numbers in Europe, Australia, and mainly the United States.

Between Centrally Planned Economies. Contrary to the popular conception that the centrally planned economies discourage any transnational labor mobility, they do have some finite flirtation with one another's work forces. Data here are even scarcer than elsewhere on migrant workers, but foreign workers have been observed in East Germany from Bulgaria, Czechoslovakia, Poland, and Romania. There are also contractual arrangements for importing workers from

the underdeveloped countries: Angola, Cuba, and Mozambique. Czechoslovakia is also known to receive workers from Poland and Yugoslavia.

Skilled technicians have also moved among the centrally planned economies. "Hungary has been sending some 3,000 technicians and engineers each year to work on two-to-three-year contracts in various industrial establishments in the German Democratic Republic. Hungary also receives small numbers of specialized workers from the German Democratic Republic and Romania."[22] In fact, such skilled worker movements crisscross many centrally planned economies, including Bulgaria and Romania. The number of such workers, however, appears to be minuscule.

Skilled Migration

The phenomenon of skilled migration fits neatly, but modestly, into the complex mosaic of international migratory flows. For its small size, however, it has been characterized by large concerns. These concerns have related to the loss of skilled nationals to foreign, often richer, nations, converting the *phenomenon* of skilled migration into the *problem* of the brain drain.

Interestingly, these concerns were first raised in European countries losing scientists to the United States in the 1960s. With a shift in the composition of professional immigrants to developing countries, the brain drain has had to share the stage with the rather cumbersome phrase "reverse transfer of technology."

How large are these flows? Before turning to the numbers, it is worth noting the serious difficulties with them.

- They are gross flows, not net of return migration. This is a serious problem if we are considering the brain drain between rich countries: skilled migrants have often returned to their home countries. It is less of a problem for the brain drain from developing countries: many fewer return, given the vast disparities of incomes and facilities between their home and destination countries.
- The data on professional immigrants are generally categorized by class of immigration visa—in the United States by the third and sixth preference categories. But professional immigrants can and do come in under the kinship and refugee categories; we simply do not know how many.
- Cross-country comparisons are notoriously difficult because of differences of classification.

• We have little systematic information on the educational levels of the professional immigrants.

Yet we must cautiously use the data we have. Professional, technical, and kindred immigrants (third and sixth preference) in the United States are only about 11 to 14 percent of total immigrants (table 7).[23] While the U..S. immigration system has remained broadly oriented to refugees and kin, however, others have not. Canada, in particular, has deployed a skill-based point system since 1962, when it shifted from a kinship-based system. As a result, Canada increased its share of professionals in immigration from an annual average of 12 percent in 1956–1960 to 20 percent in 1962–1971 while the corresponding share of unskilled workers declined from 36 percent to 16 percent.[24]

More compelling is the fact that the changes in immigration laws away from country ceilings and racial discrimination have shifted the source of professional and technical workers toward the poor countries, dramatically in the United States and less so in Canada. The changed legislation was passed in 1965 in the United States and in

TABLE 7

IMMIGRANTS TO THE UNITED STATES BY CLASS OF ADMISSION, 1979–1984

Class of Admission	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*
Total immigrants	460,348	530,639	596,600	594,131	559,763	543,903
Numerically restricted immigrants	279,478	289,479	330,409	259,749	269,213	262,016
Third preference (including spouses and children)	13,249	18,583	18,872	26,001	27,250	24,852
Third preference ("professionals" only)	5,075	8,238	8,103	11,961	12,336	10,691
Sixth preference (including spouses and children)	24,460	25,786	25,439	25,181	28,218	24,669
Sixth preference ("needed skilled or unskilled workers" only)	11,623	12,599	11,873	12,041	12,706	11,393

SOURCE: Immigration and Naturalization Service, *Statistical Yearbook* (Washington, D.C., 1986), table IMM 1.5, p. 11.

TABLE 8

SKILLED MIGRATION FROM DEVELOPING COUNTRIES TO THE UNITED STATES, CANADA, AND THE UNITED KINGDOM, 1961–1976

	Skilled Migrants from Developing Countries[a]				*Share of Developing Countries in Total Skilled Migration (percent)*		
	United States	Canada	United Kingdom	Total	United States	Canada	United Kingdom
1961–1965	14,514	6,147[b]	20,411[c]	41,072	37	20	26
1966	7,635	5,930	10,812	24,377	49	23	26
1967	8,239	8,614	8,156	25,009	52	25	21
1968	8,052	7,489	9,418	24,959	50	24	23
1969	8,419	8,286	9,932	26,637	64	28	22
1970	11,412	6,867	8,635	26,914	69	27	19
1971	16,098	6,195	7,843	30,136	85	31	18
1972	15,822	7,070	8,833	31,725	86	36	19
1973	10,602	6,180	—	16,782[d]	77	25	15
1974	8,725	7,631	—	16,356[d]	80	27	15
1975	9,298	6,362	—	15,660[d]	72	25	14
1976	—	4,842	—	4,842[e]	—	24	—
Total	118,816	81,613	84,040	284,469	61	26	22

a. The concept of skilled migration used is wider for Canada and the United Kingdom than for the United States. The United States figures include only the "professional" categories (engineers, natural and social scientists, and doctors); figures for the United Kingdom and Canada include "professional, technical, and kindred workers."
b. Total for 1963–1965 only.
c. Total for 1964–1965 only.
d. Total for the United States and Canada only.
e. Total for Canada only.
SOURCES: For the United States: unpublished data supplied by the National Science Foundation, Washington, D.C. For Canada: Department of Manpower and Immigration, Immigration Statistics. Peter Mandi, "The Brain Drain: A Sub-system of Centre Periphery Relationship," *Development and Peace*, vol. 2 (Spring 1981), table 1.

1967 in Canada (and similarly in Australia in 1958 and 1966 and in the United Kingdom in 1962 and 1965).

The share of developing countries in total skilled immigration to the United States rose to an average of nearly four-fifths through the 1970s (table 8). The rise was far more modest for Canada, but Don de Voretz and Dennis Maki, using a narrower definition of professionals, have calculated that the share of professional immigrants from developing countries in total professional immigrants almost doubled,

TABLE 9

EMIGRATION OF PROFESSIONAL PERSONNEL FROM SRI LANKA IN RELATION TO DOMESTIC STOCK, 1971–1974

	Stock in 1971	*Emigration 1971–1974*	*Emigration as Percentage of Stock*
Doctors	3,294	672	20.4
Engineers	1,983	370	18.7
Accountants	614	219	35.7
All categories	21,297	1,930	9.1

SOURCE: Department of Immigration and Emigration, *Report of the Cabinet Committee Inquiring into the Problem of Technologically, Professionally, and Academically Qualified Personnel Leaving Sri Lanka*, Sessional Paper no. 10, Colombo, November 1974, p. 10, table I. From Mandi, "Brain Drain," table 3.

from 19.7 percent during 1962–1966 to 33.3 percent during 1968–1973.[25]

The size of these skilled flows is significant for both source and destination countries for some professions, such as medicine. In 1971–1972 half the annual increment in the stock of physicians and surgeons in the United States was from immigrants, and in 1962–1966 40 percent.

The numbers are equally compelling for source countries. For the Philippines and for Sri Lanka, for example, the emigration of doctors, engineers, and other professionals in the 1970s has been a sizable fraction of the stocks of those professionals in Sri Lanka and of the increments in that stock in the Philippines (tables 9 and 10).

It is evident that many professional immigrants are students who stay on. Table 11 reports on this phenomenon for the United States for 1968–1969 for selected source countries. The students who stay on through visa adjustments constitute a sizable fraction of the total professional immigration, the implied fractions being particularly large for India, Iran, and Korea. F, H, and J visas, by and large, relate to such change of status by students to permanent residence. For 1984–1986 such conversions were heavily skewed in favor of Asian source countries, such as India, South Korea, Taiwan, Iran, and Pakistan (table 12).

Policy Responses

The phenomenon of professional migration, increasingly now from the developing or less-developed countries (LDCs) into the de-

veloped countries, has shifted the focus of concerns and policy responses since the late 1960s away from the original 1950s and early 1960s arena of skilled migration from the European Community to the United States. The issue has simply vanished from international forums oriented to the developed countries, such as the Organization for Economic Cooperation and Development in Paris, where it used to be seriously debated, and become a subject of interest to LDC-oriented international forums, such as the United Nations Conference on Trade and Development in Geneva. Since the international agencies largely reflect rather than lead national concerns, the brain drain has been on the minds of many LDC governments, leading even the moderate among them to propose policy responses that appear at first blush to be radical in scope.

Welfare Effects. Before I consider the policy proposals, however, I must stress that "brain drain" is an emotive phrase that necessarily suggests that the outflow of skilled manpower *is* a problem. Much of the scientific literature on the brain drain during the 1960s and 1970s, however, starting from the early work of Harry G. Johnson and of Herbert Grubel and Anthony Scott, showed clearly that this was not necessarily a valid inference.[26] For one thing, if we divide the source country population into the migrants and "those left behind" (itself an emotive phrase, which also suggests that migrants are permanent rather than to-and-fro migrants), the literature notes that the question of the effect on the welfare of those left behind is fairly complex. Let

TABLE 10

FLOW OF SKILLED MIGRANTS FROM THE PHILIPPINES, 1965–1976

	Average Annual Flow of Skilled Emigrants (1)	*Average Annual Increase in the Domestic Stock of Skilled Manpower* (2)	*Flow as Percentage of Increase* (1)/(2)
Doctors[a]	320	1,517	21.1
Engineers[a]	677	6,142	11.0
Physical and social scientists[b]	331	3,197	10.4
Others[b]	5,953	62,614	9.5

a. Average of the two-year period 1975–1976.
b. Average of the six-year period 1965–1970.
SOURCE: Mandi, "Brain Drain," table 2.

TABLE 11

SELECTED MIGRATION FLOWS TO THE UNITED STATES, JULY 1, 1968, THROUGH JUNE 30, 1969

Country of Origin	*Total Immigrants*	*Total Professional Immigrants Irrespective of Preference*	*Total Indirect Immigrants (all nonimmigrant visa adjustments)*	*Indirect Professional Immigrants (F, H, J visa adjustments)*[a]
Australia	1,384	300	398	58
France	2,024	252	458	44
Greece	17,724	586	1,133	256
India	5,963	2,889	2,779	1,720
Iran	1,352	486	739	376
Israel	2,049	386	851	172
Italy	23,617	501	1,749	64
Japan	3,957	403	997	312
Korea (South)	6,045	1,081	1,812	959
Netherlands	1,303	222	200	35
Norway	636	134	86	14
Philippines	20,744	7,396	2,460	560
Spain	3,916	414	1,182	367
Sweden	722	153	116	13
Thailand	1,250	400	180	99
Turkey	2,058	269	531	84
United Kingdom	15,014	2,519	1,294	142

a. F visas are held by students and their spouses and children, H visas by temporary workers and trainees, and J visas by exchange visitors, their spouses and children, and the fiancés, fiancées, and children of citizens.
SOURCE: All the data are from United States, Department of Justice, Immigration and Naturalization Service, *Annual Report*. Reproduced from Vinod Agarwal and Donald Winkler, "Migration of Professional Manpower to the United States," *Southern Economic Journal* (1985), table 1.

me illustrate with just a few examples relating to flows of professional, technical, and kindred workers.

In place of the brain drain model, one can build a spillover model, where there is unemployment among the professionals who emigrate. In this case the outflow is a safety valve that both releases resources used by families or the state to support these professionals, who produce zero output, *and* diminishes the explosive political impact in urban areas of such unemployment. At the same time, how-

TABLE 12

ALIENS ADJUSTED TO PERMANENT RESIDENT STATUS IN THE UNITED STATES, BY STATUS AT ENTRY AND REGION OF BIRTH, FISCAL YEARS 1984, 1985, AND 1986

Region of Birth	*Total*	*F1,M1*	*F2,M2*	*H's*	*J1*	*J2*
1984						
Europe	36,657	1,169	40	2,435	363	207
Asia	110,702	11,630	1,163	3,237	550	332
Africa	9,605	3,151	77	317	95	57
Oceania	1,625	138	8	137	43	25
North America	30,627	1,439	57	1,603	82	47
Central America	4,828	390	18	57	8	6
South America	10,030	1,321	59	302	62	38
All countries	199,274	18,851	1,404	8,031	1,195	706
1985						
Europe	35,356	1,319	55	2,102	430	199
Asia	112,200	13,161	1,288	3,765	597	407
Africa	11,138	3,406	109	270	93	50
Oceania	1,660	156	14	124	29	13
North America	42,710	1,551	61	1,484	97	58
Central America	4,888	385	11	46	7	6
South America	10,579	1,437	59	239	45	36
All countries	213,644	21,031	1,586	7,984	1,291	763
1986						
Europe	34,243	1,236	74	1,534	501	228
Asia	110,238	12,060	1,266	3,153	495	331
Africa	10,408	3,145	115	238	90	51
Oceania	1,582	132	10	93	31	8
North America	58,249	1,542	77	949	104	58
Central America	5,225	423	14	34	10	13
South America	10,877	1,815	78	187	58	38
All countries	225,598	19,430	1,613	6,154	1,279	714

A's—foreign government officials
B1—temporary visitors for business
B2—temporary visitors for pleasure
C's—transit aliens
D1—crewmen
E's—treaty traders and investors
F1,M1—students
F2,M2—spouses and children of students
G's—international representatives
H's—temporary workers and trainees
I1—representatives of foreign information media
J1—exchange visitors
J2—spouses and children of J1's
J's—fiancés(ées) and children of citizens
L's—intracompany transferees
N1—NATO officials
PR,RE—parolees and refugees

SOURCE: U.S. Department of Justice, Immigration and Naturalization Service, *Statistical Yearbook*, annual.

ever, as Koichi Hamada and I have argued formally, the *dynamic* effect of such an outflow may well be to raise the expected return to this class of professionals (given the substantially higher salaries in developed countries) and thus to raise the supply of them and create a larger steady-state pool of unemployed professionals in the source country.[27] In models of rural-urban migration (such as that of Seymour Harris and Michael Todaro), the unemployed are situated in the urban sector. In the international context, where immigration controls regulate entry, the unemployed must reside in the LDCs, waiting to emigrate. Thus it may be erroneous to argue that there is nothing wrong if the doctors who emigrate are "driving cabs in Manila": the possibility of emigration can increase the number of such distinguished cabdrivers. The possible fallacy of the former argument consists in assuming that there is a fixed supply of doctors.

Again, the critics of the "alarmist" brain-drain analysts have charged a fallacy of composition. There are admittedly far too few doctors in India per capita. Does that necessarily imply that the emigration of Indian doctors is harmful to India? Hla Myint has noted that the per capita figures are misleading, that doctors are to be found greatly crowded in the urban areas and the implied externality is to be found in the rural areas. He is right. But again one has to look at the dynamics of the process. There is an ongoing "internal diffusion" process: as doctors crowd into the urban areas, some begin to migrate to the surrounding quasi-urban areas, and others begin to establish one-day practices there, in a reverse urban-rural process of sorts. The brain-drain possibility then slows down this internal diffusion.[28]

While the Johnson-Grubel-Scott skepticism was necessary and clarified the nature of the argumentation required to assess the effects of professional outflows, my empirical judgment is that these outflows often create difficulties for small source countries with limited educational opportunities and substantial outflows. For large countries such as India, however, the emigration of doctors, engineers, and so on is not really a problem, although there is scope for worry about the emigration of talented, as against merely trained, professionals. Institution building in particular is likely to be adversely affected. But even here the presence of a country's distinguished nationals in prestigious foreign institutions can improve their productivity and enhance opportunities for other nationals to train abroad by exploiting the resulting networking contacts.

Thus in the former group of countries policy responses to prevent the brain drain have attracted more attention. In the latter group attention has been focused on policy responses that exploit the phenomenon to create increased advantage for the source LDCs.

The subject of both classes of policy responses is human migration, dictated by personal constraints and choices. In my view the possibility of migration should therefore not be simply *forbidden* on utilitarian grounds, citing advantage to the source countries. Rather it should be perceived as reflecting an important human right that may nonetheless be tempered by consequentialist measures falling short of absolute prohibitions.

Let me turn now to policies aimed at reducing the brain drain and to those that seek instead to accommodate to it and mitigate its consequences, and increase its possible advantages, for LDCs.

Policies to Reduce the Brain Drain. Policies to reduce the brain drain have been debated ever since the phenomenon became a public policy issue. They divide into restrictive and incentive policy suggestions.

Restrictive policies. The restrictive policy actions are, of course, the LDC counterpart of immigration restrictions in developed countries; the latter already restrict the inflow of professionals while the proposed LDC restrictions can shift the breakdown of their total between developing and developed sources of emigration. These restrictions can take the form of denying passports to exiting professionals, requiring periods of domestic service for newly graduated professionals (as for medical graduates in many countries), or making exit more difficult in other ways (as when the holding of the American Medical Association's examination for foreign doctors is forbidden in India). Few of these restrictions can really be applied to those students who stay on abroad after their studies, although the government of Sri Lanka experimented with making the renewal of passports conditional on transmission of funds and might well have made the renewal impossible so as to attempt to force the return of the émigrés.

Typically, however, these kinds of restrictions are likely both to be nuisances that are inequitably surmountable by the powerful or the ingenious and to be resented at large by the very professionals whom they seek to hold back, with possibly adverse effects on their efficiency and commitment to their societies. Hence such restrictions are invoked only infrequently and are occasionally canceled (as in Sri Lanka) in response to effective protests by the professionals.

A policy action recently addressed to reducing the professional inflow from LDCs (though not necessarily from developed countries) was the now defunct U.S. ruling that required professional exchange visitors from LDCs to return to their home country or another LDC for a period of two years before they could reenter the United States as immigrants. A later example is U.S. legislative action making the

immigration of foreign medical graduates extremely difficult, with reliance instead on expanding domestic training facilities.

A somewhat tangential U.S. policy has recently been to deny student visas in an increasing number of cases on the assumption that students stay on (as discussed with reference to table 8). This policy has not been motivated, as far as I can judge, by a need to halt the brain drain, although that is its indirect result. Rather it is motivated by a desire to prevent indirect immigration by students from LDCs. At a time when there are vast numbers of illegal immigrants, with a virtually open United States–Mexico border beyond effective control, the tendency has been to tighten flows through any immigration channels that can be better controlled, Haitian refugees and LDC students becoming the evident objects of such attention. Such roadblocks to students are undesirable in themselves, and a better policy aimed at controlling indirect professional immigration (if that is desired at all) would be to tighten the visa conversion process.

The existing "prior restraint" denial of visas is doubly offensive because U.S. consulates typically deny student visas to those with lesser means on the unproven but probably false hypothesis that the poorer they are, the more likely it is that they will stay on.[29] This principle of selective exclusion of the less endowed students violates the egalitarian principles that animate both U.S. society and its educational system (relative to those of European colleges, which have usually given easier access to the elite than to the meritorious from the LDCs). It is certainly a matter that universities in the United States need to look into more closely.

Incentive policies. As for the incentive policy suggestions, these are generally designed to make emigration less atractive. Thus salary increases and improved research facilities are typically advocated. But while a number of institutional features of professional life in LDCs could be improved, the basic difficulty lies in the impossibility of significantly narrowing the gap in professional facilities when the developed and developing countries are so far apart in resources in the first place. Besides, prescriptions to raise professional salaries yet further toward international levels have inegalitarian and welfare-reducing consequences that LDCs surely cannot ignore. Thus, even if these policies were somehow to be implemented on a significant scale and were to reduce the outflow of professional manpower, they would have to be carefully weighed for their other deleterious effects on the LDCs adopting them.

I must also mention the occasional argument (which I touched on earlier from a different vantage point) that several LDCs have overexpanded their educational facilities and that their professional emigra-

tion is a direct result of such overexpansion and consequent unemployment. Certainly, reducing the scale of educational facilities in any country experiencing emigration would *ceteris paribus* (regardless of unemployment levels) tend to lower emigration to higher-wage countries by raising, under "normal" assumptions, the domestic return to education. The desirability of such a policy, however, would depend on the precise conditions in the labor market for these professionals and the social objectives of the LDC. Thus, if the *net* domestic availability (that is, domestic supply minus emigration) of professionals falls as their total output is restricted, this could well be considered a serious negative effect of the policy. Even if the labor market is characterized by a temporary "surplus," given the current sticky wage level, it is perfectly conceivable that the reduced domestic availability, including the present surplus, would inhibit the diffusion of this kind of professional into the countryside, where the social return to their professional presence is highly valued. Furthermore, it is extremely improbable that a policy of restricting educational facilities for professionals, even if considered desirable, could be politically implemented, especially when emigration possibilities have made the returns from such educational attainment even more attractive.

Policies to Mitigate the Consequences of the Brain Drain. Fundamentally, however, the proposals to prevent the brain drain are flawed. For one thing, the forces that motivate it are much too strong to make restrictive contols effective. They include the internationalization of the professional classes; the vast disparities in facilities and incomes between the developing and the developed countries; the independence in developed countries from the bureaucratic controls that are pervasive in the LDCs; the fact that the frontiers of science are mainly in the developed countries; and the associated fact that rewards come not simply from achievement but also from its recognition, which often depends on location and contacts. Few LDCs can contemplate Soviet-style restrictions on outflows, no matter how undemocratic their regimes are at times. Interestingly, the authoritarian regimes seem to prefer decimation or expulsion of their professionals to keeping them in.

Equally, the developed countries are caught in a dilemma. On the one hand, their immigration policies are increasingly designed to favor skilled over unskilled immigrants. On the other hand, because racial bias and corresponding country quotas are no longer considered defensible, we have seen that the professional immigrants come increasingly from the LDCs. There is simply no way, therefore, that developed countries can be expected to cut back effectively on profes-

sional immigration from the LDCs. In fact, LDCs themselves would object to a return to the earlier racial quotas as an offensive affront to their rights in the community of nations. It is necessary, therefore, to change the 1950s and 1960s focus on policies to control the brain drain to policies designed to mitigate its consequences, where they are deleterious for the LDCs, and to secure for LDCs, whether harmed or otherwise, greater benefits from the skilled migration across borders.

Institutional changes. If the professional outflows, direct or indirect, are to be treated as inevitable, how then can the source LDCs benefit from the skills of their nationals (or former nationals) working abroad?

It seems evident that the institutions in both developed and developing countries will have to permit greater flexibility in their administrative policies so that professionals from LDCs can work to the advantage of their home countries. Most universities do not permit professors to hold dual appointments. But if universities in developed countries would permit such dual appointments with LDC universities, allowing locational changes between the two campuses (say, each getting the faculty member every other year), the LDCs would gain the benefits of their émigré professionals. The problem is similar to that of making institutional changes to accommodate part-time female workers in the developed countries; it requires imaginative flexibility, admittedly at some cost to efficiency.

Developed countries could help increase the incentives for professionals to remain in the LDCs by giving them temporary access to facilities in the developed countries in a number of ways. Thus major foundations in the developed countries have initiated programs to finance recurrent and protracted visits by LDC research professionals to universities and institutes: this permits flirting to be an effective substitute for marriage. Such programs enable the professionals to retain their domicile in the LDCs, where they can proceed with institution building at the substantially lower salaries there while enjoying both an increased average income and intellectual stimulus from the foreign visits. The counterpart of these programs is the financing of visits by scientists from developed countries to the LDC institutions.[30]

The flexibility will be equally necessary at the LDC end, I should stress. Institutional changes will have to be made to accommodate such "sharing" patterns. Facilitating changes would enable their professionals to have generous leaves, permitting their use of opportunities to spend greater time abroad in stimulating environments.

Faced with hesitation on the part of university administrators to adapt their conventionally tough leave policies, I once reminded my vice-chancellor in Delhi that professors could migrate if straitjacketed and that if they did not, he should remember that the brain could drain away faster sitting in one dreary dulling place than by migrating with the body elsewhere.

Tax policies. An alternative, but complementary, approach to the question of professional migration has come from a different direction. In the early 1970s I proposed a "brain drain tax." The idea was to have the migrants themselves contribute a fraction of their considerably enhanced earnings through an income tax to the development of LDCs. I felt that this was a measure of self-help by LDCs, with their own nationals contributing to their countries' development instead of exclusively urging the developed countries to tax their citizens to help the LDCs through foreign aid. As it happens, this idea received a considerable amount of attention at the UNCTAD, at several international conferences, and from lawyers and economists generally.[31]

An altogether different approach to taxation related to the brain drain has come from the concerned leaders of the LDCs.[32] In their view, the receiving countries ought to pay compensation to the sending LDCs. Whereas my proposal would extend income tax jurisdiction by LDCs to their professional nationals abroad, this alternative proposal would tax developed countries instead. Let me address the rationales of the two proposals carefully, taking the latter first.

Consider the following two statements:

> I would also like to propose the establishment of an International Labour Commission Facility (ILCF). It could be elaborated along the lines of the Trust Fund for Compensatory Facilities of the International Monetary Fund. The proposed Facility would draw its resources principally from labour-importing countries, but in a spirit of solidarity and goodwill, other ILO members may contribute to it. The accumulated resources will be diverted to developing labour-exporting countries in proportions relative to *the estimated cost incurred due to the loss of labour*.[33]

> The Commission on Development recommends that, in order to *"compensate"* for the reverse transfer of technology, resulting from such exodus, amounting to several billions of dollars for the last decade, special arrangements including the possibility of establishing special funds, should be made

> to provide the necessary resources for strengthening the technological capabilities of the developing countries.[34]

Prime Minister Edward Seaga of Jamaica is also said to be persuaded that compensation is owed to LDCs for the educational costs saved by developed countries by importing professionals.[35]

The problems with such compensation ideas, however, are fundamental. First, the educational costs estimated and cited by many experts do not make any adjustments for the fact that the higher education acquired by LDC professionals is often acquired not at home but in developed countries, this being obvious for the many student stay-ons but true also of many professionals migrating directly. The labor certification that is often necessary for such immigration requires networking contacts, which prior study in the country of immigration often facilitates. Second, and more important, it is simply implausible to ask developed countries for such compensation when they could readily stop the immigration of LDC professionals and shift to admitting more professionals from other developed countries, reverting to the pre-1960s practices. From the viewpoint of developed countries admitting LDC professionals is itself a benefit extended to the LDCs, giving their nationals a chance to get into countries with greater opportunities and prosperity. The notion of compensating LDCs for what is seen as a benefit extended to them is unlikely to sit well with governments and their constituencies.

Rather than claim compensation, either for educational costs or for difficulties imposed on those left behind in small, undereducated LDCs, as a rationale for getting developed countries to make a transfer to LDCs, I have proposed an alternative approach that may justify such a transfer. I have suggested that since developed countries presumably profit from professional immigration, whether or not from LDCs, the LDCs may well suggest that part of this gain be shared with the LDCs from which the professionals come.[36] Thus, since professionals earn higher than median salaries and are therefore taxed to redistribute to the less affluent in their host countries, some of this redistributed revenue might be shared with their home LDCs to redistribute to the less affluent there as well. This is sharing, *not* compensation; it is therefore likely to be a less grating rationale to accept than Prime Minister Seaga's latest reiteration of demands on the developed countries' exchequers for compensatory funds.

I lean instead to the view that professionals abroad, indeed citizens abroad more generally, ought to be subject to income taxation by their home countries. Except for the United States and the Philippines, all countries, including LDCs, follow the schedular system of

income tax jurisdiction, under which citizens are taxed by residence and hence escape home country taxation altogether. The ludicrous result is that Indians earning, net of U.S. taxes, incomes substantially higher than the most prosperous Indians at home, pay no taxes to India while enjoying the benefits of Citizenship. This is a system of "representation without taxation," standing the sentiments at the Boston Tea Party on their head.

I have therefore been arguing for the adoption by the LDCs of the global system to income tax jurisdiction, as in the United States, where citizenship, not residence, is the basis for taxation. This would enable those left behind to profit from the professional emigration. Professionals would then not escape the obligation to be taxed for social purposes such as redistribution simply by residing abroad. Since income taxation is also interpretable as a way of recovering the costs of educational expenditures, the global system would also ensure that professional emigrants would partially fulfill their obligations in this regard.[37]

Objections to this proposal have ranged from questions of human rights to tax administration. A typical objection is that such exercise of tax jurisdiction would violate human rights. An exit tax, especially of the Soviet variety, comes close in spirit to doing this, but not an income tax. Exercise of income tax jurisdiction over nationals abroad is recognized in international law as perfectly legitimate; it is in fact the practice of U.S. tax authorities. Tax administration, however, raises difficulties. To administer it effectively, the global tax system requires that information on the taxable income of migrant-citizens be verifiable. The cooperation of the receiving countries in this matter becomes important, if not essential. Progress here is not impossible; increasingly exchange of information hitherto regarded as beyond jurisdiction—such as information on bank accounts abroad—is becoming available by treaty. Within the United States the states are increasingly furnishing information to the federal government. The sums that can be raised, even by adopting simple and very modest surcharge formulas (as by the Philippines, which imposes a 1, 2, 3 percent tax on net-of-foreign-tax incomes of citizens abroad), are quite sizable, given the number of citizens, including professionals, now abroad.[38]

The real bottleneck to this proposal is rather the political economy of the migration process. Few of those who influence tax legislation in the LDCs, whether intellectuals or politicians, are without some family member residing abroad. It is much easier for them to demand more taxes to be paid to help their country by Professor Perlman than by their kith and kin in Pittsburgh. The problem is even

more acute for the articulate expatriate community of development experts who reside in London, Paris, and other capitals. The notion that *they* should pay taxes to their own countries—as a reflection of the egalitarian ability-to-pay criterion of income tax taxation within a society and equally as a fine example of the principle of self-reliance by developing countries—is rarely perceived by them as a pleasing one.

I have, however, been pleased to see that, in common with Senator William Proxmire, increasing numbers of Indian professionals who live and work at home under difficult conditions and high taxes have come to see the egalitarian, if not the efficiency, logic of the global tax system.[39] The idea of exercising income tax jurisdiction over nationals abroad has gained appeal, reflecting "horizontal equity" concerns between migrants and those left behind and thus beginning to change the political economy of the problem toward an acceptance of the global system of income taxation.[40]

Research Agenda

My distinguished discussants will, I am sure, draw their own conclusions about the research agenda that my analysis suggests. I might indicate, however, two salient conclusions of my own.

First, the phenomenon of international migration is sufficiently important, in a world economy and polity characterized by substantial international personal mobility, to warrant a systematic attempt at devising an international infrastructure, whether an institution like the GATT or simply a code, that addresses the resulting issues systematically and without leaving the matter to be decided by virtually autonomous actions of the receiving countries.[41]

Since the questions raised are both economic and moral, as we are dealing with humanity as the central actor in the phenomenon of migration, the institution or the code will have to be broader in scope than simply the economic-agenda-oriented institutions and codes that address issues of trade, exchange rates, and capital flows. We need to address questions such as these:

- Should governments be allowed to expel, as Ghana did, foreign nationals, even illegal ones, except over a protracted period, so as to minimize economic hardship for the migrants and the economic difficulties that would follow for the source countries?
- How should legal migrants be treated? Should they be offered civil rights equal to those of natives, or are there specific constraints on their rights as members of the host society that are acceptable in

civilized societies? For example, Sweden permits migrants to vote in all but national elections, but the United States does not; the question bears very closely on how effectively migrants' rights can be protected in pluralistic societies.

- Should the nature and degree of enforcement at the border be a matter entirely within the discretion of the receiving country? That is, should countries be freely allowed, to put it starkly, to shoot at people coming across the border or should the illegal immigrants across the Rio Grande just be bused back to come right across the border the next day?

There are two approaches to devising the institutions and codes on such questions. Either one can proceed from first principles, as in political theory, and define what one would like to see, quite regardless of what governments are likely to accept. Alternatively—a procedure I prefer—one can examine the evolving practices and construct a set of rules that better reflect the limits within which acceptable rules can be defined. A research agenda could thus pointedly address the experience we have had of receiving countries' practices in dealing with refugees, illegal migrants, and others (examining, for instance, the United States–Mexico, the Bangladesh-India, and other border situations, where illegal migration has been a major problem).

Second, I would certainly like to have a research program addressed to the question of devising institutional flexibility, in both developing and developed countries, to ensure that LDCs manage to share effectively in the services of their professional émigrés. I would like to see the diaspora model examined in regard to the issue of taxation. Both sets of responses to the inevitable out-migration of professionals from developing to developed countries should make it easier to accommodate to the process of such skilled migratory flows without desperate attempts at interfering with the desirable freedom of such professionals to migrate and relocate where they wish.

Notes

1. By interdependence I simply mean linkages. Greater linkage for a country, however, does not necessarily imply greater "dependence"—that is, vulnerability to the outside world. Thus a higher debt may imply a greater vulnerability by the creditor, not the debtor. Again, an increased trade share by a *force majeure* such as the United States may mean that it becomes more concerned with issues such as reciprocity in trade and hence problematic in its external economic relations for other trading partners than when it had a lower ratio of trade to GNP.

2. Successive tariff-cutting trade rounds under GATT auspices have

brought average tariffs on semimanufactures and manufactures in the United States, the European Community, and Japan down to 4.9 percent, 6.0 percent, and 5.4 percent, respectively, since the Tokyo round in the late 1970s.

The market forces may have reflected government actions. Thus the OPEC surpluses, which greatly accentuated the growth of the world's capital market, were themselves a product of a governments-led cartel. Again, the recycling of petrodollars was not just a market phenomenon: it was a policy goal of the United States.

3. Strictly, the GATT is not a Bretton Woods institution. But, along with the International Monetary Fund and the World Bank, which are, the GATT is regarded (in view of the context and timing of its conception and birth) as part of the trinity of Bretton Woods institutions.

4. There is room for debate whether rapid growth led to rapid liberalization of trade or vice versa. The sensible position seems to be that, in pluralistic economies, trade liberalization will *politically* proceed faster when growth is higher and prosperity eases the task of adjustment whereas *economically* more rapid growth will follow if trade is liberalized rather than hampered. The process must be regarded as interactive.

5. Michael Walzer, *Spheres of Justice: A Defence of Pluralism and Equality* (New York: Basic Books, 1983).

6. Cf. the views of Franciscus a Vittoria in his *Reflectiones Theologicae* (Spanish edition, Buenos Aires, 1946), where he wrote of the "Right of Natural Society and Communication" and argued that "it has been a custom from the beginning of the world for anyone to go into whatever country he chooses and prohibition of entrance is a violent measure not removed from war."

7. This is not to deny that these policies are influenced by market forces of supply and demand. An expansion of immigrant quotas may well reflect an increased scarcity of labor that results in pressure group lobbying to increase the quotas. But it also may not.

8. The popular terms for people who go back and forth between countries are "to-and-fro" and "yo-yo" migrants. Even the nineteenth century migration to the United States, often thought of as permanent, was characterized by a nonnegligible life cycle and other phenomena of return migration. The present sophistication has replaced the earlier practice in the scientific literature of ignoring the distinction between "gross" and "net" inflows of aliens in interpreting the customary gross inflow figures and of discussing the consequences of phenomena such as the brain drain as once-and-for-all movements of the skilled to other nations.

9. Gurushri Swamy, *Population and International Migration*, World Bank Staff Working Paper, no. 689 (Washington, D.C., 1985).

10. The categorization by these two classes is not straightforward or uniform among countries, as I will note later.

11. For details, see United Nations, *International Migration Policies and Programmes* (New York, 1982), chap. 5.

12. Swamy *(Population and International Migration)* quotes estimates putting

the number of migrant workers in Argentina and Venezuela at about 2 million recently.

13. Swamy puts the figure for Ghana and Ivory Coast together at 1 million foreign workers in 1975 (ibid.).

14. The drawing back, however, did not mean that the stock of *Gastarbeiter* was reduced. Ironically, the "temporary" workers could not really be returned to the source countries in most cases, illustrating the dilemmas posed by worker programs for hard policy options. As Max Frisch, the Swiss novelist, has remarked, "We imported workers and got men instead."

15. These totals include the workers from the poorer countries of the Organization for Economic Cooperation and Development (OECD), such as Spain, Italy, and Greece.

16. Swamy, *Population and International Migration*, p. 7.

17. Ibid.

18. The bracero program lasted over two decades and imported nearly 4.5 million farm workers. It was terminated in 1964 but has been effectively replaced by the H-2 visa program, which admits similar workers.

19. The most disturbing instances of the former relate to flows between poor countries. Ghana in 1969 expelled 200,000 to 500,000 illegal aliens within two weeks by enforcing the Alien Compliance Act. The most recent example of amnesty is the U.S. legislation conferring amnesty on illegal immigrants who have resided continuously in the United States since 1982.

20. These refugees may be either skilled or unskilled. The composition is mixed and varies among countries and over time.

21. Curiously, the arbitrariness of such distinctions goes to absurd lengths from an economist's viewpoint. Thus Prime Minister Ytzhak Shamir of Israel wants to direct Soviet Jews, refugees by any definition, toward Israel. These Soviet émigrés then have a definite offer of destination in friendly Israel. But if the United States admits them nonetheless as refugees, it is manifest that the Soviets are making an "economic" choice between Israel and the United States as their destination. But U.S. policy (which Prime Minister Shamir would like to change to exclude Soviet refugees from the United States) admits them as "political" refugees while rejecting many others, including Salvadorans, Haitians, and Guatemalans, as "economic" refugees even when they have no other destination.

22. United Nations, *International Migration Policies and Programs*, pp. 35–36.

23. The sixth preference includes some unskilled immigrants (such as housemaids) as well. The third and sixth preference visas together constitute 20 percent of the numerically restricted preference system visas of the United States, but the spouses and children of the primary recipients of these visas are also charged to these two categories.

24. Barry Chiswick, Testimony before Subcommittee on Immigration and Refugee Policy of the Committee on the Judiciary, U.S. Senate, 97th Congress, November 23, 1981, serial no. J-97-83; and Louis Parnai, "Canada's Immigration Policy: 1962–74," *International Migration Review* (Winter 1975), pp. 469–72.

25. Don VeVoretz and Dennis Maki, "The Size and Distribution of Human Capital Transfers from LDCs to Canada: 1966–1973," *Economic Development and Cultural Change* (July 1980), table 1.

26. Harry G. Johnson, "The Economics of the 'Brain Drain': The Canadian Case," *Minerva* (1965); and Herbert Grubel and Anthony D. Scott "The International Flow of Human Capital," *American Economic Review* (May 1966).

27. Jagdish Bhagwati and Koichi Hamada, "The Brain Drain, International Integration of Markets for Professionals, and Unemployment: A Theoretical Analysis," *Journal of Development Economics*, vol. 1, no. 1 (1974); reprinted in Jagdish Bhagwati, ed., *The Brain Drain and Taxation II: Theory and Empirical Analysis* (Amsterdam: North-Holland, 1976), chap. 6.

28. Ibid.

29. There is much casual evidence on this subject but no systematic data, since the visa denial procedure is inherently free from public scrutiny and certainly not subject to due process restraints. This problem has, however, raised a substantial protest in India.

30. In both cases, of course, the results can be deleterious if the programs are ill-administered. If the LDCs manage them so that the foreign visits are controlled and allocated on a patronage basis, the programs will generate diversion of professional energy into patronage cultivation; and the use of funds to bring in low-grade but highly paid scientists may well generate resentment in the indigenous professional community.

31. The original proposal was spelled out in Jagdish Bhagwati, "The Loss of Innocence: U.S. in the Nixon Era," *Daedalus* (1972), and then in Jagdish Bhagwati and William Dellalfar, "The Brain Drain and Income Taxations," *World Development*, vol. 1, no. 1 (1973). It has gone through extensive examination and reformation since then. Cf. Jagdish Bhagwati and Martin Partington, eds., *Taxing the Brain Drain: I. A Proposal* (Amsterdam: North-Holland, 1970), and Jagdish Bhagwati and John Wilson, eds., *Income Taxation and International Mobility* (Amsterdam: North-Holland, 1987).

32. The idea is also in the academic literature, although my own writings have discounted its appeal. It has recently been pushed by Crown Prince Hassan bin Talal of Jordan in 1977 and by Prime Minister Edward Seaga of Jamaica.

33. Address by Crown Prince Hassan bin Talal to the International Labor Organization (ILO), Geneva, June 1977.

34. Committee on International Economic Cooperation (Paris, 1977).

35. Cited in André Payenne, "Plugging the Brain Drain: A Third World Call for Western Reparations," *World Press Review* (August 1985), pp. 33–34.

36. Jagdish Bhagwati, "The Brain Drain: International Flow Accounting Compensation, Taxation, and Related Proposals" (Paper for the Intergovernment Group of Experts Meeting, UNCTAD, Geneva); printed in Jagdish Bhagwati, ed., *Essays in Development Economics*, vol. 1, *Dependence and Interdependence* (Oxford: Basil Blackwell, 1985), chap. 19.

37. The question has been dealt with analytically in the format of the optimal tax literature in a Symposium Issue of the *Journal of Public Economics*,

vol. 18 (1962); and it is also the subject of further analysis in Bhagwati and Wilson, *Income Taxation*.

38. Bhagwati, *The Brain Drain and Taxation II*.

39. Senator Proxmire has been a driving force in ensuring that Americans abroad keep paying their share of U.S. taxes, so that the pub-crawling Americans in Paris do not get free drinks while the proletariat in Pittsburgh bears the burden of U.S. taxation. Cf. Bhagwati, "The Brain Drain."

40. The extensive analysis of this idea has explored several other objections also. Let me mention a few salient ones: Would it mean that Ugandans abroad would have to pay taxes to Idi Amin? No; they could refuse to pay. Besides, Western courts today do not enforce laws of foreign nations. If tax information were supplied to LDCs by developed countries, would Idi Amin get information on Ugandans abroad? No; such arrangements are governed by tax treaties, and these could readily accommodate suspension during well-defined political emergencies. Would it encourage change of nationality and thus hurt revenues gathered? No; for the schedular system produces no revenues at all, whereas the global system, even if some emigrants changed nationality, would produce revenues greater than zero. Besides, the optimal tax rates chosen would reflect this consideration. Further, where tax rates have been kept low, as in the Philippines, few nationality changes have been induced. Would it cut into remittances? No; few of the professionals and others who would be so taxed (while the poorer émigré citizens would benefit from exemptions) make remittances anyway; remittances are a feature of unskilled and poorer migration.

41. There are, indeed, beginnings of such a code, such as five ILO conventions on immigrant workers' rights. But they relate to limited aspects of the many problems raised by migrations of various kinds.

Commentaries

John T. Dunlop

I am delighted to make some comments on the paper as well as on the topic itself. Much of what I want to add is, perhaps, in the area of policy applications. I realize that such remarks may extend the discussion beyond the present framework.

I begin by paying respect to Professor Bhagwati's attempt to pull together the numbers in the field. They are peculiarly elusive as well as conceptually vague.

These are my points. Even if they seem cryptic, they are designed to be trenchant.

First, although Bhagwati focuses on skilled labor, finding a meaningful distinction between skilled and unskilled labor is extremely difficult, particularly when it relates to international migration. Charles Kindleberger reminded us how hard it is to equate skills between countries; and when labor is recruited abroad, it is problematic whether skill "equivalence" can be fixed.[1] Although "equivalence" sounds to many like fancy professor language, I do want to offer several suggestions for consideration.

Is the skilled-unskilled definition appropriate, much less sufficient, to the understanding of the operation of labor markets? For example, even impoverished Mexican immigrants can often read and write Spanish. When we remember that about 20 percent of today's native American labor force is functionally illiterate (unable to read or do even simple arithmetic), how should we categorize the competition between the Spanish-literate Mexican immigrant and the native illiterate? And this competition is not only on the lowest unskilled plane. For some highly trained professionals, like physicians and lawyers, there is little or no correspondence or equivalence in state examinations. This observation is further reinforced in its complexity when we recall that immigrants tend to come when they are young, that their status improves with the length of their residency, and that the difference in earnings between the immigrants and the native-

born tends to diminish and even to cross over. Oded Stark's book offers a number of exemplar studies on this point.[2]

Second, from a theoretical standpoint I know of no useful model of an internationally free labor market in the sense that many theorists offer micromodels of supposedly responsive domestic labor markets. Nowhere is there an analytical system combining internationally freely flowing trade in capital, services, and manpower. For this absence there are good reasons, and I certainly do not urge that the hiatus be filled. Nonetheless, its existence does raise questions that have been indicatively discussed.

The larger topic is whether migration serves to depress or encourage increased wages and output per worker in the receiving country. A wise answer may be that it depends on the existing state of the market and technology in the importing country and the quality of imports open to that country's buyers. What may have been true of nineteenth-century America and what is true of today's Brazil are probably quite different. This point is hardly new; in a 1981 review essay Mark Perlman made strong mention of Kuznets's handling of this question in his 1960 article.[3] There Kuznets suggested that expanding populations are themselves so economically stimulative that the iron law of wages can become inoperative. This topic cries for more empirical investigation.

Too much of our thinking is dominated by the simple assumptions of competitive markets and constant returns to scale. These assumptions are, I am convinced, irrelevant to the world we have, particularly when human capital is an essential part of the immigrants' "baggage."

Third, I turn to the importation of physicians into the United States. In 1963, when we had 31,000 foreign medical school graduates, there were 238,000 America-trained physicians. By 1985 that 31,000 had jumped almost fourfold to 119,000 while the number of domestically trained physicians had risen less than twofold to 424,000. What do these numbers mean economically?

I would argue that the rise in foreign-trained physicians has reduced the rate of growth of the domestically trained physicians' incomes. More interesting, however, is that our medical schools, 127 in number, still turn out no more than 17,000 graduates each year. The importing of so much medical skill probably depressed physicians' earnings growth in some areas; but even then, before such generalizations are drawn, one has to take into account the complex facts of geographic and specialty distribution.

Next, with regard to Bhagwati's interest in devising a new inter-

national economic infrastructure for economic redress, I would remind him that the International Labor Organization (ILO) has five or more conventions dealing with aspects of his interest. Convention 97, the most appropriate one, deals with the control of the standard code for national behavior—what information about immigration and jobs should be readily available; what medical services should be provided to immigrants in transit; and what laws are required to handle nondiscrimination with respect to remuneration, union membership, accommodation, access to employment agencies, and remittances to the sending areas. I do not suggest that the ILO conventions are invariably honored (obeyed when ratified, much less ratified in the first place), but in institutions creating infrastructure, we are not starting from scratch.

Fifth, what has all of this to do with universities? As a former dean I retain a keen interest in such issues, particularly when I have a rare opportunity to tell another university what it ought to do.

It would be enormously instructive to liberal arts undergraduates to have a course on several of the great migrations in history, so that comparisons could be made. For example, one could do a study of the Moslem expansions in the eighth, ninth, tenth, and eleventh centuries.

One could deal a bit with Genghis Khan, a colorful figure who led his armies into far lands. One could also compare the populating of Brazil and the United States. One could examine, as Kindleberger did, what happened in Europe when the stage was set for the unfolding of the industrial revolution.

These historical migrations occurred in spurts and were often not sustained. Nor are they always in the past. Consider the recent case of Saudi Arabia, which imported workers (whom it kept in compounds) to build plants and oil refineries.

Another matter to offer to undergraduates is the set of issues associated with the American labor force during the next decade. One surely is the impact of the Hispanic migration during the next quarter-century on bilingual education and the necessary policy adjustments within labor markets—of firms and unions, and in politics.

On a more analytical plane, universities might stimulate work to answer the question of the characteristics of those who move and those who do not: What are the movers' motivations, and what underlies the process of social or economic integration? Oded Stark's interest in how immigrants (usually only a small part of any total population) cluster and are assimilated are the kinds of thing I have in mind, which should interest not only economists but also sociologists and political scientists. Other points he raises are how earlier immi-

grants treat later immigrants, how immigrants' traits distinguish them from the native-born, and what the comparative performance time paths are of the new and the established.

Finally, with regard to university research and policy, I am less than optimistic. University personnel tend to be unappreciative of the many light-years of distance between their analysis and policy formation and execution. In 1986 we Americans enacted major reform legislation relating to immigration. Were any academics behind this enactment? Was it the result of someone's research? Did it grow out of some seminar? Quite the contrary—the active political forces were the Hispanic community, not always of one mind, my friends in the labor movement, and my friends in management. They have been lobbying for these basic changes since 1977. Their strong civil rights concern led to the application of the principle of amnesty. Professors and their eager-beaver students are not the ones who really hatch policy. This is a thought to remember well.

Notes

1. Charles P. Kindleberger, *Europe's Postwar Growth: The Role of Labor Supply* (Cambridge, Mass.: Harvard University Press, 1967), pp. 3, 189.

2. Oded Stark, *Research in Human Capital and Development, A Research Annual: Migration, Human Capital, and Development* (Greenwich, Conn.: JAI Press, 1986), vol. 4.

3. Mark Perlman, "Reviewing Population and Economic Change in Developing Countries," *Journal of Economic Literature*, vol. 19, no. 1 (March 1981), pp. 74–82; and Simon Kuznets, "Population Change and Aggregate Output," in *Demographic and Economic Change in Developing Countries*, a conference of the Universities–National Bureau of Economic Research, Committee for Economic Research (Princeton, N.J.: Princeton University Press for the NBER, 1960), pp. 324–40.

Joseph Eaton

In his paper "Global Interdependence and International Migration," Professor Bhagwati mentioned that the idea of globalization of income taxation has been pushed by the crown prince of Jordan, Prince Hassan bin Talal, and by Prime Minister Edward Seaga of Jamaica. He omits, however, the support of this notion by the government of the United States.

U.S. Support for an Internationalized Income Tax. Publication 514 of the Internal Revenue Service, *Foreign Tax Credits for U.S. Citizens and Resident Aliens,* spells out the generous provisions under which the United States gives full credit for taxes paid to any foreign nation, even those with whom we do not have friendly diplomatic relations. They can be claimed as a tax credit against the U.S. income tax. If the foreign tax exceeds what is owed to the IRS, the national of an LDC owes no tax to the United States, even though he or she lives in this country and benefits from its many public services. I recall no mention of this generous pro-third-world provision in the press of India or that of the many other third world nations that take so much satisfaction in criticizing the United States while soft-pedaling criticisms of the allegedly more third-world-oriented Soviet Union.

For implementation of the Bhagwati plan, third world nations need to enact legislation imposing an income tax liability on their overseas nationals. It should not be difficult, then, to negotiate an agreement with the United States to exchange information with them about their respective nationals—in the event some of them fail to make their payments to their country of origin or citizenship.

There are a growing number of international agreements for the exchange of social security and pension payments. Within the European Economic Community, deductions for social benefits in the country of origin can be deducted from wages earned in another country. The United States and most European nations with market economies will send pensions to those who have earned them even though they reside overseas. Poland earns hard-to-get dollars by being hospitable to elderly expatriates who want to retire in their old homeland.

Investment-oriented Remittances. Another relevant fact in the international economy of migration would, because of its importance, warrant a separate paper. The economy of many resource-poor countries is greatly aided by remittances from overseas countries to the national's family at home. Egypt, Yugoslavia, the People's Democratic Republic of Yemen, the Yemen Arab Republic, and Israel obtain significant foreign exchange earnings in this manner.

In developed nations considerable hidden export earnings are generated by consultants, who use their expertise overseas or serve foreign nationals in the United States—as does the University of Pittsburgh through our distinguished medical and educational programs. The total earnings, probably well in excess of $100 million a year, are significant components of the economy of our city.

Developing nations need to organize programs that maximize the

influx of foreign exchange from remittances for investment purposes through legal rather than black market channels. One of my recent doctoral students, Dr. Garoot Eissa, made such a proposal for the Sudan in his dissertation, entitled "International Migration as a Channel for the Transfer of Productive Capacity between Rich and Poor Countries."[1] He noted that in the Sudan most remittances are directed toward the importation of consumption goods or investment in housing. Little is invested in agriculture or industry. Much of it goes through black market channels, at rates of exchange much higher than the official exchange rates.

Incentive programs for more investment-oriented uses of remittances need to be considered. In addition, local currency rates for remittances need to be close to the real exchange rate to discourage their being funneled through the black market. Foreign exchange accounts, savings, or bonds can be permitted in countries where there is reason to distrust the stability of the local currency. Remittances can earn interest payable in local currency, based on the current value of the foreign currency, irrespective of inflation.

Funding Programs. Few countries have tried to copy the development bond programs of Israel and Puerto Rico. Bonds are offered for sale to nationals and sympathizers, and the proceeds are used for economic and social development enterprises. The interest paid is often somewhat below the market rate, but those who are willing to invest have enough emotional investment in what the bonds will do for the country to earn less than an optimum return.

This measure will not work, however, for nations that mistreat their citizens. By using repressive policies, the Soviet Union has forfeited billions of dollars of potential voluntary aid from expatriates, who did so much to help rebuild war-torn homeland communities in England, Germany, and the rest of Western Europe.

Hundreds of young Americans volunteered to fight in the British army to defend Britain against Hitler when the United States still maintained a policy of neutrality, between 1939 and December 7, 1941. Tens of thousands of Americans showed their support of the British motherland, even though Americans fought a revolution and the War of 1812 against that country. Every plane seat from Europe and the United States to Tel Aviv was taken by volunteers rushing to Israel when that country became involved in wars in 1967 and 1973.

Expatriates are a much underused resource by their country of origin; many are treated like pariahs. It is understandable that some left behind might feel envious, just as some of those who emigrated might feel guilty for not remaining to help in the battle for a better life.

These complex emotions can be the basis of economic development programs, capable of generating resources for the ancestral homeland—among both the emigrants and their expatriate children who may never have been there. Multiple patriotic sentiments, unlike treason and espionage, do not normally give rise to accusations of inappropriate double loyalty. Andrew Carnegie's love for England and Scotland did not diminish his Americanism or the regard with which his memory is still cherished in Pittsburgh.

A workable bonding strategy available to developing nations might include the following:

- Low-cost round-trip tickets to the homeland might be provided to encourage frequent visits to strengthen the ties of identification with family, local community, and former homeland.
- Professor Bhagwati suggests a high degree of administrative flexibility to encourage dual appointments for expatriate professors in universities in their homeland. This would enable them to devote part of their career to the country's development without having to surrender their more lucrative posts abroad, where they can command adequate resources—research and other—to maintain their career momentum. The problem, as Bhagwati points out, is similar to that of making institutional changes to accommodate part-time female workers.
- Emigrants might be allowed to keep their original citizenship even if they become naturalized in the country of emigration. Prominent American professors are among the leaders of the National Council of the Palestine Liberation Organization, as well as in many Israeli public service programs.
- Low-cost educational, language, and acculturation summer programs for children of expatriates are maintained by such nations as Poland, Germany, Turkey, Israel, and Jordan.

Bonding programs are likely to strengthen the predisposition of expatriates to retain their ethnic identity. Sooner or later, these bonding policies will be translated into investments among expatriates with resources, even when the chances of earning an economic return are less than optimum.

One World Ideology. These prohomeland activities are aided by a significant change in the nature of patriotism in the international scene. Hyphenated Americans were disdained before World War II. In Sweden the government actually pays for special programs to help the children of immigrants learn the language of their parents. Bilingual schooling is available in some American cities, in view of the

large number of Spanish-speaking newcomers. Caring for one's country of origin is not necessarily a sign of disloyalty to the new homeland. At least in the United States, there is enough support for the one world concept to facilitate consideration of mutual economic benefits from brain-drain and guest labor programs.

What keeps such programs from being seriously considered in the United States is the partisan anti-Western posture of too many third world nations. Their disapproval of some of our policies has escalated into excessive anti–United States rhetoric at the United Nations and other international forums.

Note

1. Garoot Eissa, Ph.D. diss., Graduate Faculty of the School of Public and International Affairs, University of Pittsburgh, 1985.

Discussion

PROFESSOR BHAGWATI opened the discussion by recounting a dilemma he faced early in his professional career. Should he—an Indian national, part of whose education was financed by the Indian government—accept a tenured professorship at a leading American university (Columbia) or return to his native land to repay the "debt" of his education as well as to improve educational conditions there? The dilemma was explicitly formulated by the Columbia professor who, when tendering the offer, urged Bhagwati not to accept it. Bhagwati went on to note that he did return to India and only later accepted a position at MIT and then at Columbia as a full-time professor.

What Bhagwati really sought to stress was that there are two sets of asymmetries: one contrasting the treatment of the free trade in goods and human capital, the other contrasting the views of the sending as distinct from the receiving countries. As for the first, countries increasingly draw a distinction between exporting and importing goods and exporting and importing human capital. It is desirable to have a positive balance with regard to goods; it is not desirable to have a positive balance with regard to workers.

Bhagwati then turned to another aspect of these asymmetries—the role of motivation. Export of goods is a simple pecuniary matter, with both ex ante and ex post maximization efficiently and objectively feasible. Motives for the export of human capital or jobs, whether assessed ex ante or ex post, are highly subjective, all sorts of nonpecuniary elements being involved.

Bhagwati's third point dealt with a special problem of international equity. Was it morally more acceptable for the United States to draw human capital away from West Germany, where the loss seems likely to be marginally small, than it would be for the United States to draw human capital away from Zaire, where the loss seems likely to be marginally tremendous?

Bhagwati followed by raising a policy question with which he has been associated (if, in part, erroneously). Can an emigrant morally "square" things by repaying the society that gave him his education, if

he chooses to leave? If so, is the question of repayment solely up to the emigrant, or should the two governments also be involved—the one paying the other? Payment (or repayment) for the right to emigrate is a thorny topic, but that it is hard to grasp does not preclude its having to be handled. Just what rights does an emigrant or immigrant have? Are they only the rights to pay taxes and to be drafted for military or jury service, or should they include a voice in policy making (that is, in voting locally or nationally) as well? As for the rationale of taxation, it involves not only payment for services rendered but also some consideration of relative individual ability to pay.

Professor Eaton noted certain complications. Some institutional conventions increase the question of equity—often where there are tax treaties, those who pay taxes in one country are not taxed in the second. Then there is the huge question of the individual's "Helsinki" right to migrate, something that Eaton suggested ought not to be buried by a need for compensatory tax settlements. He also suggested that remittances sent to the country of origin by emigrants are one way in which the donor country frequently benefits.

Bhagwati's Reply to Dunlop

Professor Bhagwati responded to Professor Dunlop's comments by saying that the problem of integrating the role of immigration into a university curriculum went well beyond purely economic considerations. Drawing on the humanitarian aspects that the session's chairman, Secretary Nathan Stark, had faced while in federal office, Bhagwati went on to comment that even they had an economic face, as the work of Barry Chiswick and others (including Jacob Mincer) had shown in their studies of group assimilation curves as reflected in differential average income returns on educational investment. Noting that Labor Secretary Ray Marshall's program for abolishing sweatshops in Texas was tied to Marshall's moral sense, not to his career as a professor of economics, Bhagwati turned the group's attention to other stimuli for economists' professional interest. He mentioned that the International Labor Organization's conventions were basically "noneconomic" sources of economists' interest in the topic of refugees and the labor services they can provide. Economists also had to consider constraints some of which were self-imposed and of a moral nature; civilized nations do not shoot workers illegally crossing borders, nor do they expel illegal workers without due process. Picking up Professor Dunlop's emphasis on the segmentation of labor markets, Bhagwati agreed that there was an immediate need to look at the

ways data are collected *and arranged* to get a picture of who was coming in and going out.

Bhagwati returned to the discussion of compensation for the training of immigrants. In contrast to the "Zaire medical student" who received the large "value-added" part of his training in the industrialized country is the "Indian" model; the immigrant was superbly trained at the Delhi School of Economics before migrating. In this instance the future immigrant was motivated to attend the Delhi school because its diploma was a license to seek the American green card. How does one identify what skill came from the exporting country and what was added after the international move?

General Discussion

KONSTANTIN REMCHUKOV (Patrice Lumumba University, Moscow), noting that the mission of his university was to prepare personnel for work in the third world, offered another dimension for considering the topic of global taxation. He asked whether Professor Eaton agreed that the "import stimulation of skilled workers" was to compensate for ex ante errors associated with free-market imperfections or with errors in state planning. Remchukov, citing Jan Tinbergen for first noting this point in his studies for the Club of Rome, said that further evidence of this point has been furnished by Prime Minister Yitzhak Shamir of Israel, whom he reported as having said that "Israel fights for the rights of Soviet Jews to emigrate from the Soviet Union, not for the right to emigrate, *but rather to emigrate to Israel because apparently Israel needs their skills and possible military services*" [emphasis added].

PROFESSOR EATON's response stressed his opinion that the individual's debt to the state was itself constrained by his or her right to make the important choices in life—liberty meant that impediments should not be put in the individual's way. Immigration, like migration between jobs and areas in any given country, is "an important moral issue of human rights." The United States was built on that assumption. If its citizens want to migrate to the Soviet Union, that is their right. Moreover, some international surveillance may be warranted to prevent a person from becoming either a servant indentured to the state or an "object of peonage."

These issues, Eaton thought, are not only apart from economic considerations but superior to them. "When a person migrates, we should look at the equities involved between the right of a person to earn a living and that of his [original] homeland to benefit" from his contributions to its economy. Whether an income tax, however it is

paid and allocated, is the appropriate means must be decided in light of the tension between that individual's human rights (as defined in the Helsinki agreement) and the country's normal interest in benefiting from his or her labors. His own conclusion was that "no economic issue should become an excuse to violate any basic human right."

MUHAMMAD SHAHIDULLAH, a doctoral student in the University of Pittsburgh Sociology Department, noted that the brain drain is confusing in that the immigrants do not always come from poor LDCs; some come from Taiwan, Hong Kong, Malaysia, Indonesia, and India. He went on to note that the remission of earnings or the payment of taxes to the country of origin probably misses the critical economic point—what the home country may need is the skills that it lost, not pecuniary compensation.

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The study of international economics has traditionally focused on trade in finished products or capital between countries. Increasingly, however, the production process has become an international endeavor. Japanese technology, for example, may be combined with labor from Mexico to produce goods in the United States that are destined for Europe, financed by British banking services, and marketed by an Italian firm in France. In this book eminent scholars and distinguished commentators explore the implications of the global production process. They examine the evolving international markets for capital, labor, technology, and distribution, focusing on trade, public policy, and the future direction of academic research. The principal contributors are Arthur F. Burns, Lewis M. Branscomb, Yotaro Kobayashi, and Jagdish Bhagwati.

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